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Another SAUNDERS BOOK on Page 3

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EFFICACY OF TONSILLECTOMY FOR THE REMOVAL OF FOCAL INFECTION *

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AND
GEORGE F. DICK, M.D.
CHICAGO

A recent government report [1] estimates that about one third of all operations performed in the United States are for the removal of tonsils. The rate has increased from five to ten fold since 1910. Such an increase indicates a widespread recognition of the important rôle of the tonsils in the causation of systemic disease. It goes without saying that tonsillectomy would not increase in public favor unless beneficial results were obtained. However, a careful analysis of the available data shows that good results are by no means universal.

Kaiser [2] reported on 48,000 school children observed for a period of years, 20,000 of whom had had their tonsils removed. Most of the operations had been performed at least five years before the report was made. The incidence of rheumatic fever, joint pains or growing pains was 8 per cent in the tonsillectomized group as against 10 per cent in the nontonsillectomized group. Chorea occurred in 0.4 per cent of the former group and in 0.5 per cent of the latter, and rheumatic carditis was observed in 2.2 per cent of the tonsillectomized children and in 2.9 per cent of the nontonsillectomized children. However, Kaiser found that heart lesions developed much less frequently after tonsillectomy than before. These differences, while slightly in favor of the tonsillectomized groups, are too small to be impressive. In the school children of Hagerstown, Md., Collins [1] found the incidence of lesions usually attributable to tonsillar infection practically the same in the tonsillectomized and nontonsillectomized groups. The studies of Ingerman and Wilson,[3] based on 105 children with rheumatic fever, would indicate that recurrences of rheumatice fever were as frequent in those children whose tonsils had been removed as in those not operated on.

Our clinical experience with patients who have undergone tonsillectomy has led us to the belief that the disappointing results reported by the foregoing and other observers may often be due to the fact that in a large number of instances the tonsils are incompletely removed. We have had several patients who were not benefited by their original tonsillectomies but who did improve strikingly after the removal of infected pieces of tonsillar tissue left from the first operation.

Although many writers emphasize the importance of complete removal of tonsils, the data on the number of "tonsil stumps" left in and their rôle as foci of infection are meager. Clark [4] examined 143 patients who had had tonsillectomies from three to four years previously and found tonsil tissue remaining in fifty-nine. Many of these patients had not been relieved of the trouble that was the chief indication for tonsillectomy. In routine physical examinations of the nurses entering training at the Presbyterian and Cook County hospitals, we have found fairly large pieces of tonsillar tissue remaining in the throats of 290 of 403 (73 per cent) who have had tonsillectomy. That such "tonsil stumps" frequently cause trouble is shown by our series of twenty-three cases collected almost entirely from our own services in less than a year, in every one of which the indication for tonsillectomy was definite and in which improvement resulted in all whom we have been able to follow.

In 1922, Caylor and Dick [5] demonstrated a definite relation between the quantitative bacterial content of tonsils and their probable connection with disease elsewhere in the body. Tonsils with a high bacterial content were more often associated with arthritis, neuritis and heart disease than those with a low bacterial content. In the present study an estimate of the importance of tonsil stumps as the cause of morbidity is attempted by the same method. The bacterial count, microscopic appearance and association with systemic lesions of a series of tonsils removed for the first time is compared with similar data on "tonsil stumps" remaining from previous tonsillectomies and removed for a variety of reasons.

PROCEDURE

The tonsillar tissue was received into dry, sterile medicine glasses; examinations were made and cultures were taken at once. The tonsils were washed by shaking in a 200 cc. sterile, wide-mouthed bottle in sterile physiologic solution of sodium chloride to which enough sodium hydroxide had been added to make 0.01 per cent, in order to remove mucus. One liter was used in this way, about 100 cc. being poured into the bottle at a time and then decanted off. Pieces of tonsil tissue ranging in size from 0.371 to 1.806 Gm. were cut from the centers of all tonsils or tonsil fragments for culture,

* From the John McCormick Institute for Infectious Diseases and the Scarlet Fever Committee.

1. Collins, S. D., and Sydenstricker, E. A.: Epidemiological and Statistical Study of Tonsillitis, Pub. Health Bull. 175, 1927.

2. Kaiser, A. D.: Incidence of Rheumatism, Chorea and Heart Disease in Tonsillectomized Children, J. A. M. A. **89**: 2239 (Dec. 31) 1927.

3. Ingerman, Eugenia; and Wilson, May G.: Rheumatism: Its Manifestations in Childhood Today: Tonsillectomy in Its Relation to Recurrence of Rheumatism, J. A. M. A. **82**: 759 (March 8) 1924.

4. Clark, J. P.: Results in a Series of Cases of Tonsillectomy at the Massachusetts General Hospital Three to Four Years After Operation, J. Am. Laryng. A. **35**: 43, 1913.

5. Caylor, H. D., and Dick, G. F.: Quantitative Bacteriology of the Tonsils, J. A. M. A. **78**: 570 (Feb. 25) 1922.

the sterile knife passing straight from the outside surface through the capsule. The pieces were ground thoroughly in a sterile mortar containing a little sand and 10 cc. of sterile broth. Dilutions up to 1 : 1,000,000 in plain broth were made of this material and 1 cc. of each dilution added to a tube containing 10 cc. of melted agar and 1.0 cc. of sheep blood. The mixtures were poured into petri plates and incubated forty-eight hours. The colonies were then counted with the aid of a magnifying glass and the number of bacteria per gram of tonsil tissue estimated. Gross pathologic descriptions were made of the tonsils before sectioning, and histologic descriptions of paraffin sections made from the parts not used for cultures.

In the tables the "predominating organisms" listed were those occurring in the higher dilutions. Often, for example, hemolytic streptococci were found in dilutions of 1 : 1,000 but in none above that and were therefore not included in the predominating flora. The differentiation of *Pneumococcus* and *Streptococcus viridans* was not undertaken other than morphologically. Hence both are included under the term "green forming cocci."

RESULTS

The average count per gram in the "tonsil stumps" was 7,341,000, as compared with 5,693,000 in tonsils removed for the first time. The total weight of the "stumps" removed from a single patient varied from 0.575 to 5.496, averaging 2.174 Gm., while that of tonsils removed for the first time varied from 3.243 to 9.80, averaging 5.918 Gm.

In practically all tonsillectomies some muscle is removed with the tonsil proper. In removing the tonsil stumps, since the object was completely to rid the throat of tonsillar tissue, rather large pieces of the surrounding muscle were often removed. When it is recalled that in many of the stumps of which cultures were taken there was more muscle than lymphoid tissue, the higher bacterial content of the "stumps" becomes even more significant.

The average total bacterial count of the tonsil stumps removed from a single patient was 15,588,000, while that of tonsils removed for the first time was 33,345,000.

To determine whether the bacteria obtained in the cultures were from the depths of the crypts and the tonsil tissue proper or merely from the outside surface,

TABLE 1.—*Description and Bacterial Counts of Tonsils Removed at First Tonsil Oporation*

Case	Clinical Symptoms	Clinical Diagnosis	Microscopic Description	Anatomic Diagnosis	Predominating Organisms	Weight of Tonsils, Gm.	Bacteria per Gm.	Estimated Total Bacterial Content
1	Enlarged tonsils	Hypertrophied tonsils	Lymph follicles hyperplastic	Chronic hyperplastic tonsillitis	Green forming cocci; staphylococci; hemolytic streptococci	6.153	48,200	1,272,000
2	Frequent mild sore throats; hyperthyroidism	Buried tonsils	Infiltration of crypt walls with polymorphonuclears; increased peritonsillar fibrosis; lymph follicles hyperplastic	Chronic ulcerative and hyperplastic tonsillitis; fibrous peritonsillitis	Green forming cocci; staphylococci; diphtheroids	6.42	622,000	3,993,000
3	Polyarthritis	Hypertrophied tonsils; surface scarring	Surface of crypts denuded in depths; interstitial fibrosis	Chronic ulcerative and fibrous tonsillitis	Green forming cocci; hemolytic streptococci; staphylococci	5.755	655,000	3,770,000
4	Enlarged tonsils	Hypertrophied tonsils	Lymph follicles hyperplastic	Chronic hyperplastic tonsillitis	Green forming cocci; staphylococci	4.879	811,000	3,956,000
5	Myositis; thrombophlebitis	Hypertrophied tonsils	Calcific deposits; some loss of crypt epithelium; slight polymorphonuclear infiltration of crypt walls	Chronic ulcerative and hyperplastic tonsillitis	Nonhemolytic streptococci; hemolytic streptococci; green forming cocci	6.67	907,000	6,050,000
6	Hyperthyroidism	Hypertrophied tonsils	Lymph follicles hyperplastic; small areas of necrosis with polymorphonuclear infiltration at bases of crypts	Chronic suppurative and hyperplastic tonsillitis	Hemolytic streptococci; staphylococci; green forming cocci	6.40	970,000	6,208,000
7	Chronic tonsillitis	Hypertrophied tonsils	Lymphoid follicles hyperplastic	Chronic hyperplastic tonsillitis	Green forming cocci; hemolytic streptococci; staphylococci	9.80	1,051,000	10,299,000
8	Chronic sinus infection; mitral regurgitation	Chronic atrophic tonsillitis	Epithelial pearls; increase in peritonsillar and interstitial fibrous tissue; hyperplastic lymphoid follicles	Chronic fibrous tonsillitis and peritonsillitis	Green forming cocci; hemolytic streptococci	3.727	1,259,000	4,511,000
9	Enlarged tonsils	Hypertrophied tonsils	Slight pressure necrosis of of lymphoid cells; much hyperplasia of lymphoid follicles	Chronic hyperplastic tonsillitis	Hemolytic streptococci; green forming cocci; staphylococci; diphtheroids	6.87	1,490,000	10,236,000
10	Enlarged tonsils	Hypertrophied tonsils	Lymph follicles hyperplastic	Chronic hyperplastic tonsillitis	Hemolytic streptococci; green forming cocci	6.635	1,980,000	12,526,000
11	Frequent sore throat	Hypertrophied tonsils	Lymph follicles hyperplastic	Chronic hyperplastic tonsillitis	Hemolytic streptococci; green forming cocci	7.571	2,097,000	15,876,000
12	Hyperthyroidism; frequent sore throat	Chronic atrophic tonsillitis	Some loss of epithelium at bases of crypts; actinomyces-like granules in crypts; increase in fibrous tissue of capsule	Chronic ulcerative and fibrous tonsillitis	Green forming cocci	4.819	2,693,000	12,977,000
13	Frequent sore throat; duodenal ulcer	Hypertrophied tonsils	Hyperplastic lymphoid follicles; some crypt walls infiltrated with polymorphonuclears	Chronic hyperplastic and ulcerative tonsillitis	Green forming cocci; staphylococci and diphtheroids; hemolytic streptococci	7.375	2,734,000	20,163,000
14	Subacute polyarthritis	Chronic atrophic tonsillitis	Marked increase in interstitial fibrous tissue with compression of lymphoid cells	Chronic fibrous tonsillitis and peritonsillitis	Green forming cocci; staphylococci; hemolytic streptococci	5.002	3,202,000	16,016,000

TABLE 1.—*Description and Bacterial Counts of Tonsils Removed at First Tonsil Operation—Continued*

Case	Clinical Symptoms	Clinical Diagnosis	Microscopic Description	Anatomic Diagnosis	Predominating Organisms	Weight of Tonsils, Gm.	Bacteria per Gm.	Estimated Total Bacterial Content
15	Enlarged tonsils; frequent sore throat	Hypertrophied tonsils	Lymph follicles hyperplastic; some interstitial fibrosis	Chronic hyperplastic tonsillitis with moderate fibrous tonsillitis	Small gram-positive bacilli; green forming cocci; hemolytic streptococci	7.55	3,307,000	24,968,000
16	Frequent sore throat	Hypertrophied tonsils	Much leukocytic infiltration of epithelium of both surface and crypts; hyperplastic lymphoid follicles	Chronic ulcerative and hyperplastic tonsillitis	Green forming cocci; staphylococci and diphtheroids; hemolytic streptococci	6.099	3,619,000	22,072,000
17	Chronic hypertrophic infectious arthritis	Chronic atrophic tonsillitis	Small abscess on surface; much interstitial fibrosis with atrophy of lymphoid follicles	Chronic fibrous tonsillitis and peritonsillitis; suppurative tonsillitis	Green forming cocci; hemolytic streptococci	3.243	3,755,000	12,177,000
18	Enlarged tonsils	Hypertrophied tonsils	Some loss of epithelium in crypts, with leukocytes in cavities; lymphoid follicles hyperplastic	Chronic hyperplastic and ulcerative tonsillitis	Hemolytic streptococci; green forming cocci; staphylococci	4.788	3,789,000	18,142,000
19	Frequent sore throats	Small scarred tonsils	Surface epithelial layer increased in thickness; epithelium of crypts infiltrated with polymorphonuclears	Chronic ulcerative tonsillitis; chronic fibrous tonsillitis	Green forming cocci; staphylocci	4.34	4,634,000	20,112,000
21	Arthritis; chronic rheumatic endocarditis	Chronic atrophic tonsillitis	Lymphoid follicles that remain are hyperplastic; interstitial fibrosis	Chronic fibrous and chronic hyperplastic tonsillitis	Green forming cocci; hemolytic streptococci; staphylococci	3.94	5,283,000	21,446,000
22	Chronic arthritis	Chronic atrophic tonsillitis	Only small islands of tonsillar typical tonsillar tissue remain; much interstitial and peritonsillar fibrosis	Chronic fibrous tonsillitis and peritonsillitis	Green forming cocci; staphylococci and diphtheroids	3.44	6,106,000	21,005,000
23	Enlarged tonsils	Hypertrophied tonsils	Lymphoid follicles hyperplastic; epithelium of crypts denuded in many places and infiltrated in others with leukocytes	Chronic hyperplastic and ulcerative tonsillitis	Hemolytic streptococci; green forming staphylococci	6.425	7,481,000	48,130,000
24	Rheumatic endocarditis	Hypertrophied, injected tonsils	Epithelium of surface and crypts infiltrated with leukocytes; minute areas of necrosis containing polymorphonuclears just beneath crypt lining	Chronic ulcerative tonsillitis with minute abscesses; chronic hyperplastic tonsillitis	Green forming cocci; staphylococci; hemolytic streptococci	6.577	13,980,000	91,464,000
25	Convalescent from acute rheumatic fever	Hypertrophied tonsils	Epithelium of surface and crypts infiltrated with leukocytes; miliary abscesses beneath surface epithelium; increase in peritonsillar fibrous tissue	Chronic ulcerative tonsillitis with minute abscesses; chronic fibrous peritonsillitis	Hemolytic streptococci; green forming staphylococci	7.96	17,571,000	138,865,000
26	Frequent sore throat; recurring arthritis	Chronic atrophic tonsillitis	Increased peritonsillar and interstitial fibrosis; many polymorphonuclears in parenchyma of tonsil; leukocytic infiltration of crypt walls	Chronic ulcerative and suppurative tonsillitis; chronic fibrous tonsillitis and peritonsillitis	Hemolytic streptococci; nonhemolytic streptococci; green forming cocci	5.497	52,283,000	287,400,000
					Average.....	5.918	5,693,000	33,345,000

two experiments were made. In case 1 of table 1, cultures of weighed pieces cut from the center of the same tonsil were taken, one after washing as described and the other without washing. In the washed piece the count was 48,200 per gram and in the unwashed piece 415,000 per gram, suggesting that much of the surface contamination was eliminated by washing. As the result of an operative slip a piece of normal uvula was clipped off. Cultures were taken in the usual way, the count being 65,860 per gram—much lower than the average count in the tonsil series. Since the surface exposed in the case of the uvula was as great as or greater than that of the pieces of tonsil of which cultures were taken, it seems unlikely that the greatest part of the bacterial content of the cultures was from surface contamination.

It should also be pointed out that the growth due to surface contamination would be greater in the "whole tonsil" series than in the tonsil stumps, because of the greater surface exposed; yet the number of bacteria per gram is much higher in the "stumps" than in the whole tonsil.

In table 1, in the cases in which clinical symptoms are recorded as "enlarged tonsils," the specimens were obtained from the throat, nose and ear clinic of the Cook County Hospital. The previous history of these patients, all small children, is not known. They were sent in by outside physicians, mostly school health inspectors, because of "hypertrophied tonsils." The other patients were from our own services, and the indications for tonsillectomy appeared clear to us.

CLINICAL RESULTS

In certain cases in the group from which "tonsil stumps" were removed, the clinical improvement was so striking as to merit special comment. Patients 8 and 21 (table 2) were nurses who were practically incapacitated by arthritis and frequent sore throats. Within a month after all lymphoid tissue remaining from previous tonsillectomies was removed, both improved strikingly and have not been off duty since (ten and fifteen months, respectively). Patient 18 (table 2) had a single attack of acute tonsillitis in March, 1925. She continued to have fever after the other acute symptoms subsided, and developed cardiac enlargement and a mitral murmur. She continued to have a low grade fever with occasional afebrile periods of one or two weeks until Dec. 3, 1926, when her tonsils were removed

(case 23 of table 1). After recovery from the tonsillectomy she remained afebrile for two weeks but then resumed her former course of nearly constant low grade fever. Two small tags of tonsil tissue remaining from the first operation were removed. Three weeks later she became free from fever and remained so until discharged from the hospital two months later. She is now back on duty and has had no recurrence of symptoms. Patient 10 (table 2), also diagnosed as having rheumatic endocarditis, for several weeks had had a daily rise in temperature of 99 to 99.6 F. until her "tonsil stumps" were removed. She had been completely afebrile for three weeks when discharged from the hospital and has remained so.

MICROSCOPIC OBSERVATIONS

Machlachlan [6] has shown that the outstanding change in tonsils associated with rheumatic fever is peritonsillar fibrosis. Numerous workers [7] have pointed out that small, scarred tonsils, the seat of frequent throat infections, were more often associated with systemic diseases than hypertrophied tonsils in which there was little scarring. If a high bacterial content may be taken as evidence of disease-producing potentialities, the results of Caylor and Dick,[5] together with those reported here, confirm this view.

As was to be anticipated, the outstanding change in the "tonsil stumps" examined was fibrosis.

There was always increased fibrous tissue of the capsule and trabeculae, with interstitial fibrosis at the peripheries of the follicles. The fibrous tissue between the surface epithelium and the lymphoid tissue of the tonsil was nearly always increased. Often the fibrosis had divided the lymphoid tissue into small islands entirely separated from one another and from the surface. Evidences of the shutting off of crypt orifices were seen in the dilated crypts not connected with the surface filled entirely with desquamated epithelial cells and lymphocytes and lined with a single row of epithelial cells. In others the epithelium was entirely absent in the depth of the crypt at certain places and there were polymorphonuclears and bacteria scattered among the lymphoid cells nearest the denuded crypt wall. At some such points there had been considerable cell destruction. Such crypts were usually filled with

6. Machlachlan, W. W. G., and Richey, deW. G.: The Histopathology of the Tonsil in Acute Rheumatic Fever and Chorea, Tr. A. Am. Phys. **42**: 315, 1927.

7. Hill, F. T.: What is Wrong with the Tonsil Operation? Kellert, E.: The Pathological Histology of the Tonsils Containing Hemolytic Streptococci, J. M. Research **41**: 387 (May) 1920. Hambrecht, Leonora; and Nuzum, F. R.: A Correlated Study of the Indications for Tonsillectomy and of the Pathology and Bacteriology of the Excised Tonsils, Arch. Int. Med. **29**: 635 (May) 1922. Shambaugh, G. E.: The Faucial Tonsils as a Focus for Systemic Infection, Tr. Am. Laryngol. A. **35**: 53, 1912.

TABLE 2.—*Description and Bacterial Counts of "Tonsil Stumps" Remaining from Previous Operations and Removed at a Second or Third Tonsil Operation*

Case	Clinical Symptoms	Clinical Diagnosis	Microscopic Description	Anatomic Diagnosis	Predominating Organisms	Weight of Pieces, Gm.	Bacteria per Gram	Estimated Total Bacterial Count
1	Subacute polyarthritis	"Tonsil stumps"	Small crypts containing only degenerated epithelial cells; some polymorphonuclear infiltration of crypt wall	Slight chronic infection in tonsillar remnants	Green forming cocci; staphylococci	1.825	92,200	168,300
2	Frequent sore throat	One small "tonsil stump"	Scattered lymphoid cells in fibrous tissue beneath typical tonsillar epithelium	Fibrosis in tonsillar remnant	Green forming cocci; gram-positive bacilli and staphylococci	0.636	126,700	84,400
3	Large "tonsil stumps"	"Tonsil stumps"	Some peritonsillar and some interstitial fibrosis	Chronic fibrous tonsillitis in tonsillar remnants	Green forming cocci; nonhemolytic streptococci	3.198	408,000	1,305,000
4	Frequent sore throat	"Tonsil stumps"	Some interstitial fibrosis	Chronic fibrous tonsillitis in tonsillar remnant	Green forming cocci; small gram-negative bacilli	1.34	711,000	952,000
5	Frequent sore throat; subacute arthritis	"Tonsil stumps"	(No section)	Chronic fibrous tonsillitis in tonsillar remnant	Hemolytic streptococci	0.913	942,000	888,300
6	Frequent sore throat; neuritis	"Tonsil stumps"	Peritonsillar and interstitial fibrosis; walls of some crypts infiltrated with polymorphonuclears	Chronic ulcerative tonsillitis; chronic fibrous tonsillitis and peritonsillitis in tonsillar remnant	Green forming cocci; staphylococci	2.562	1,250,000	3,202,000
7	Chronic arthritis	"Tonsil stumps"	Much thickening of epithelial layer; hyperplasia of lymphoid follicles	Chronic hyperplastic tonsillitis in tonsillar remnants	Green forming cocci; staphylococci	0.405	1,292,000	523,000
8	Neuritis	"Tonsil stumps" (remaining after several cauterizations)	Much interstitial fibrosis; infiltration of epithelium with polymorphonuclears	Chronic fibrous tonsillitis in tonsillar remnants	Green forming cocci; staphylococci	3.395	1,509,000	5,123,000
9	Chronic arthritis and sinusitis	"Tonsil stumps"	(No section)	Chronic fibrous tonsillitis in tonsillar remnants	Green forming cocci; staphylococci	0.575	1,568,000	902,000
10	Frequent sore throat; chronic sinusitis	Large "tonsil stumps"	Lymphoid follicles hyperplastic; some interstitial fibrosis; many polymorphonuclears within crypts	Chronic hyperplastic and fibrous tonsillitis in tonsillar remnants	Green forming cocci; hemolytic streptococci	5.496	1,936,000	10,640,000
11	Chronic rheumatic endocarditis	"Tonsil stumps"	Much interstitial and peritonsillar fibrosis; much infiltration of crypt epithelium with leukocytes	Chronic fibrous tonsillitis and peritonsillitis in tonsillar remnants	Nonhemolytic streptococci; green forming cocci; hemolytic streptococci	1.399	2,431,000	3,401,000
12	Polyarthritis; chronic rheumatic endocarditis	"Tonsil stumps"	Much interstitial and peritonsillar fibrosis; crypts entirely cut off from surface	Chronic fibrous tonsillitis and peritonsillitis in tonsillar remnants	Green forming cocci; hemolytic streptococci; staphylococci	2.805	2,774,000	7,291,000

TABLE 2.—*Description and Bacterial Counts of "Tonsil Stumps" Remaining from Previous Operations and Removed at a Second or Third Tonsil Operation—Continued*

Case	Clinical Symptoms	Clinical Diagnosis	Microscopic Description	Anatomic Diagnosis	Predominating Organisms	Weight of Pieces, Gm.	Bacteria per Gram	Estimated Total Bacterial Count
13	Frequent sore throat	"Tonsil stumps" remaining from removal by fulguration 3 months before	Crypt epithelium infiltrated with polymorphonuclears, entirely gone in some places; interstitial fibrosis	Chronic ulcerative and fibrous tonsillitis in tonsillar remnants	Green forming cocci	4.08	2,782,000	11,350,000
14	Frequent sore throat	"Tonsil stumps"	Several small areas of necrosis in crypt walls and extending into parenchyma; hyperplastic lymphoid follicles	Chronic suppurative and hyperplastic tonsillitis in tonsillar remnant	Green forming cocci; staphylococci; hemolytic streptococci	1.056	3,008,000	3,176,000
15	Frequent sore throat; persistent fever	Large "tonsil stumps"	Crypt walls infiltrated with polymorphonuclears; small areas of necrosis at termination of crypts	Chronic ulcerative and hyperplastic tonsillitis in tonsillar remnant	Green forming cocci; staphylococci	4.235	3,048,000	12,908,000
16	Infectious polyarthritis	"Tonsil stumps"	Only a narrow zone of tonsil tissue near surface; one small abscess; interstitial fibrosis	Suppurative and fibrous tonsillitis in tonsillar remnant	Green forming cocci; staphylococci; hemolytic streptococci	2.0	3,356,000	6,712,000
17	Hyperthyroidism; arthritis	"Tonsil stumps"; two previous tonsillectomies	Much peritonsillar and interstitial fibrosis; loss of epithelium and infiltration with leukocytes in crypts	Chronic ulcerative and fibrous tonsillitis and peritonsillitis in tonsillar remnants	Green forming cocci; staphylococci; hemolytic streptococci	1.185	3,450,000	4,088,000
18	Subacute arthritis	"Tonsil stumps"	Much peritonsillar and interstitial fibrosis; lymphoid follicles hyperplastic	Chronic hyperplastic tonsillitis and chronic fibrous tonsillitis and peritonsillitis in tonsillar remnants	Green forming cocci; staphylococci and gram-positive bacilli; hemolytic streptococci	0.79	7,506,000	5,933,000
19	Frequent sore throat; hyperthyroidism	"Tonsil stumps"	Interstitial and peritonsillar fibrosis; polymorphonuclear infiltration in walls of crypts	Chronic ulcerative tonsillitis; fibrous tonsillitis and peritonsillitis in tonsillar remnants	Green forming cocci; staphylococci	4.447	9,680,000	43,047,000
20	Chronic infectious arthritis	"Tonsil stumps"	Many small areas of necrosis and polymorphonuclear cell infiltration in parenchyma and in surrounding fibrous tissue	Chronic suppurative and fibrous tonsillitis and peritonsillitis in tonsillar remnants	Green forming cocci; staphylococci; hemolytic streptococci	0.748	22,910,000	17,137,000
21	Hyperthyroidism	"Tonsil stumps"	Much interstitial and peritonsillar fibrosis; lymphoid follicles hyperplastic	Chronic hyperplastic tonsillitis; fibrous tonsillitis and peritonsilitis	Green forming cocci; hemolytic streptococci; staphylococci	1.749	23,172,000	40,527,000
22	Chronic rheumatic endocarditis; arthritis	"Tonsil stumps"	Small areas of necrosis and polymorphonuclear infiltration in both crypt epithelium and parenchyma; interstitial fibrosis	Chronic ulcerative and suppurative tonsillitis in tonsillar remnants	Hemolytic streptococci; green forming cocci; staphylococci	3.42	30,534,000	104,426,000
23	Meningomyelitis	"Tonsil stumps"	Much interstitial and peritonsillar fibrosis; lymphoid follicles hyperpastic	Chronic fibrous tonsillitis and peritonsillitis in tonsillar remnants	Green forming cocci; nonhemolytic streptococci; small gram-negative bacilli; hemolytic streptococci	1.685	44,355,000	74,738,000
					Average.....	2.174	7,341,000	15,588,000

desquamated epithelial cells, lymphocytes, some polymorphonuclears, formless débris and bacteria. Ulceration and the attendant changes in the crypts were found most often in the tonsils and "stumps" with high bacterial counts.

ANIMAL INOCULATIONS

In order to determine the relative pathogenicity of the micro-organisms studied, series of rabbit inoculations were made, with strains from patients in whom the clinical observations pointed toward the tonsils as foci of infection. Whole broth cultures 24 or 48 hours old were given intravenously in small, gradually increasing doses over a period of about two weeks. Usually the initial dose was 0.5 cc. and the final dose from 3 to 5 cc. In this way it was hoped to simulate more nearly the mechanism of focal infection in man than is done when initial doses of 5 or 10 cc. of whole culture are given. The animals that did not die of the ensuing infection were killed from three weeks to five months after the last dose. The autopsy observations are given in table 3.

It will be seen that the types and number of lesions produced with strains from whole tonsils were roughly comparable to those with strains from tonsil "stumps." The slightly higher incidence of arthritis produced by the "whole tonsil" organisms is probably accounted for by the fact that hemolytic streptococci were used seven times in that series and only twice in the tonsil "stumps" series.

COMMENT

The most frequent object in removing tonsils is to rid the body of tissue harboring bacteria capable of producing disease in other parts of the body.

Yet it is shown by this work that tonsillectomy as usually done, even by specialists of established reputation, fails to accomplish this end in 73 per cent of cases because of incomplete removal of infected tonsillar tissue.

There is even some indication that in many instances the condition resulting from incomplete tonsillectomy is worse than that existing before operation.

CONCLUSIONS

Pieces of tonsillar tissue of appreciable size were found in the throats of 73 per cent of persons who had undergone tonsillectomy.

TABLE 3.—*Summary of Principal Lesions Produced by Intravenous Injections of Pure Broth Cultures of Bacteria from Cultures of Tonsils*

A. Strains from Tonsils Removed at First Tonsil Operation (From Cases listed in table 1)

Source	Clinical Diagnosis of Patient	Tyye of Micro-organism	Arthritis	Myositis	Peri-carditis	Nephritis	Osteo-myelitis	Myo-carditis	Peri-tonitis	Vegetative Endo-carditis	Broncho-pneu-monia	Enter-itis
1. Case 3	Polyarthritis	Green forming diplococcus	+	..	..	..	..	+	..	..	..	..
2. Case 3	Polyarthritis	Hemolytic strep-tococcus	+	..	..	..	..	..	..	..	..	..
3. Case 5	Myositis; throm-bophlebitis	Hemolytic strep-tococcus	+	+	..	..	..	..	..	..	..	..
4. Case 5	Myositis; throm-bophlebitis	Green forming streptococcus	+	+	..	..	..	..	..	..	..	..
5. Case 5	Myositis; throm-bophlebitis	Nonhemolytic streptococcus	+	..	..	..	..	..	..	..	..	..
6. Case 17	Chronic hyper-trophic arthritis	Green forming streptococcus	+	..	..	..	..	..	..	..	..	..
7. Case 17	Chronic hyper-trophic arthritis	Hemolytic strep-tococcus	+	..	+	..	..	..	..	..	..	..
8. Case 20	Old rheumatic endocarditis; arthritis	Green forming streptococcus	+	..	..	+	..	..	..	..	..	..
9. Case 20	Old rheumatic endocarditis; arthritis	Hemolytic strep-tococcus	+	+	..	..	+	..	..	..	..	..
10. Case 20	Old rheumatic endocarditis; arthritis	Green forming diplococcus	No lesions found		..	..	..	..	..	..	..	..
11. Case 23	Rheumatic endo-carditis	Green forming streptococcus	+	..	..	..	+	+	..	..	..	..
12. Case 23	Rheumatic endo-carditis	Hemolytic strep-tococcus	+	..	..	..	..	..	..	..	..	..
13. Case 24	Convalescent acute rheumatic fever	Hemolytic strep-tococcus	..	..	..	..	..	..	+	..	..	..
14. Case 25	Frequent sore throat; poly-arthritis	Hemolytic strep-tococcus	..	..	..	+ urinary calculi	..	..	..	..	..	..
15. Case 25	Frequent sore throat; poly-arthritis	Nonhemolytic streptococcus	+	..	..	..	..	..	..	+	..	..
16. Case 25	Frequent sore throat; poly-arthritis	Green forming diplococcus	+	..	+	..	..	..	..	..	+	..
17. Case 25	Frequent sore throat; poly-arthritis	Green forming streptococcus	+	..	..	..	..	..	..	..	..	..
Totals			13	3	2	2	2	2	1	1	1	0

B. Strains from "Tonsil Stumps" Remaining from a Previous Operation and Removed at a Second or Third Tonsil Operation (From Cases Listed in table 2)

1. Case 1	Subacute poly-arthritis	Green forming streptococcus	..	..	..	..	..	..	..	..	+	..
2. Case 2	Subacute poly-arthritis	Green forming streptococcus	+	..	..	..	..	..	..	..	..	..
3. Case 6	Frequent sore throat; neuritis	Green forming streptococcus	..	..	..	..	..	..	..	+	..	..
4. Case 6	Frequent sore throat; neuritis	Green forming streptococcus	No gross lesions		..	..	..	..	..	..	..	..
5. Case 15	Frequent sore throat	Green forming streptococcus	+	..	..	..	+	..	..	..	..	..
6. Case 16	Infectious poly-arthritis	Green forming streptococcus	+	..	..	..	..	..	..	..	..	..
7. Case 16	Infectious poly-arthritis	Green forming streptococcus	+	..	..	..	..	..	..	..	..	..
8. Case 17	Hyperthyroidism; arthritis	Green forming streptococcus	No gross lesions		..	..	..	..	..	..	..	..
9. Case 17	Hyperthyroidism; arthritis	Green forming streptococcus	..	..	..	..	..	..	..	..	..	+
10. Case 21	Hyperthyroidism	Green forming diplococcus	No gross lesions		..	..	..	..	..	..	..	..
11. Case 21	Hyperthyroidism	Hemolytic strep-tococcus	+	+	..	..	..	..	..	..	+	..
12. Case 22	Chronic rheumatic endocarditis	Green forming streptococcus	+	..	..	+	..	..	..	..	..	..
13. Case 22	Chronic rheumatic endocarditis	Hemolytic strep-tococcus	+	..	..	..	..	..	..	..	..	..
Totals			7	1	0	1	1	0	0	1	2	1

That these "tonsil stumps" have considerable clinical significance is shown by the fact that in the fairly large series in which cultures were taken the "stumps" harbored more pathogenic bacteria per gram than tonsils removed for the first time. Also there are clinical cases in which patients with systemic diseases attributable to foci of infection failed to improve after their original tonsillectomy but improved strikingly after removal of the pieces of tonsillar tissue remaining from the first operation.

The complete removal of all tonsillar tissue is necessary when the operation of tonsillectomy is undertaken.

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SYMPTOMS, DIAGNOSIS AND PATHOLOGY OF TULAREMIA *

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Four clinical types of tularemia have been noted from a study of 679 case reports:

1. *Ulceroglandular Type.*—The primary lesion is a papule of the skin, later an ulcer, and is accompanied by enlargement of the regional lymph glands.
2. *Oculoglandular Type.*—The primary lesion is a conjunctivitis and is accompanied by enlargement of the regional lymph glands.
3. *Glandular Type.*—There is no primary lesion at the site of infection, but there is enlargement of the regional lymph glands.
4. *Typhoid Type.*—There is no primary lesion nor is there glandular enlargement. (The word "typhoid" is used here in the sense of an absence of manifest external lesions and not as signifying the so-called typhoid state of mind.)

SOURCES OF HUMAN INFECTION

1. Ulceroglandular type, 455 cases:

Twenty-three were fly-bitten (*Chrysops discalis*).
Thirty-three were tick-bitten (*Dermacentor andersoni*).
Twenty-one were tick-bitten (*Dermacentor variabilis?*).
Six were associated with sheep and ticks.
Four were bitten by insects (species?).
One hundred were market men who had dressed rabbits.
Twenty-five had dressed rabbits bought in the market.
Ninety-eight had dressed rabbits which they had shot.
Thirty-four had dissected jack rabbits.
One hundred and thirty-one had dressed rabbits the source of which was not stated.
One had killed and skinned a woodchuck.
One was bitten by a coyote.
One was bitten by a ground squirrel.
One was bitten by a hog.
One was scratched by a cat.

2. Oculoglandular type, thirty-two cases:

Twenty-one had skinned or dressed wild rabbits.
Eight had crushed ticks with their fingers.
One had crushed a fly with his fingers.
Two (source of infection was uncertain).

3. Glandular type, twenty-five cases:

Twenty-four had dressed rabbits.
One was an experimental human subject.

4. Typhoid type, twenty-eight cases:

Twenty had performed autopsies on laboratory animals or handled ticks.
Six had dressed wild rabbits.
One was tick-bitten.
One was probably tick-bitten.

NONCONTAGIOUSNESS

No instance has been reported of the spread of the infection from man to man by mere contact or by the bite of insects that have previously bitten a patient. Surgeons who have incised or excised suppurating glands have not contracted the infection. Nurses who have attended these patients have not become ill.

SYMPTOMS AND COURSE

Incubation.—The period of incubation has been definitely determined in 259 cases in which there was a single exposure to infection. In these there was a period of twenty-four hours in 16 cases, two days in 54 cases, three days in 73 cases, four days in 58 cases, five days in 33 cases, six days in 11 cases, seven days in 8 cases, eight days in 1 case, nine days in 1 case, and ten days in 3 cases, the average being three and one-half days. In laboratory workers and market men daily exposed to infection, the incubation period could not be determined.

Onset.—The onset is sudden, often occurring while the patient is at work, and is manifested characteristically by headache, vomiting, chilliness, chills, aching bodily pains, sweating, prostration and fever.

Ulceroglandular Type.—These patients complain, within forty-eight hours after the onset, of pain in the area of the lymph glands which drain the site of infection. On examination, these glands are found to be tender and slightly enlarged. Only the regional glands are involved, and not those of other parts of the body. The glandular pain precedes by about twenty-four hours any definite reference by the patient to the site of infection, which then becomes manifest as a painful, swollen, inflamed papule, which breaks down, liberating a necrotic core or plug and leaving an ulcer about three-eighths inch (1 cm.) in diameter, with raised edges, and having a punched-out appearance. On healing, the ulcer is replaced by scar tissue.

There is redness of the skin overlying the enlarged and tender lymph glands, and this redness may be continuous to the site of infection, or red streaks may be visible on an extremity. In about half of the cases the lymph glands proceed to suppuration, and after the inflammation has subsided an abscess ruptures through a soft, thin spot in the skin. In the other half of the cases the glands do not break down but remain hard, palpable and rather tender for two or three months, gradually returning to normal. Lymph glands other than the regional glands were slightly enlarged and tender in certain cases.

Lymph glands in such unusual locations as "region of biceps," "midarm," "midforearm" or "dorsum of hand" have proceeded to abscess formation.

Subcutaneous nodules simulating sporotrichosis were noted on the forearm and arm in thirty-eight cases. They were distributed not only along the anterior surface but also over the posterior surface of the forearm or arm, and extended from the ulcer on the fingers to the enlarged axillary glands. The nodules were firm and movable, but many of them ultimately suppurated. They varied in size from that of a pea to 1 cm. in diameter, and their number varied from one to thirty.

Weakness, loss of weight, recurring chills, sweats and prostration are often noted during the active stage of the disease, which lasts from two to three weeks.

Oculoglandular Type.—These cases follow the general description previously given, but with primary localization in the conjunctival sac instead of the skin. Of thirty-two patients, twenty-nine had unilateral involvement of the eye and glands, eleven being right-sided and eighteen being left-sided; three had simultaneous bilateral involvement of the eyes and glands. In the early stage the eye manifests irritation, weeping, swelling of the lids and surrounding tissues, edema of the ocular conjunctiva, and usually a papule on the conjunctiva of the lower lid. At the same time there is swelling, tenderness and pain in some of the following lymph glands: preauricular, parotid, submaxillary, anterior cervical, and, in severe cases, the axillary group. Small, discrete ulcers appear very soon on the con-

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junctiva of both lids. The constitutional reaction is manifested by fever, chills, sweating, prostration and, in severe cases, by convulsions, delirium and stupor. A purulent dacryocystitis was noted in three cases. In half of the cases the glands suppurated. No involvement of the sinuses was noted.

Permanent impairment of vision was noted in only one case, which proceeded to blindness of the affected eye following a perforation of the cornea, protrusion of the iris, and fusion of the cornea and iris into a compact mass.

Fulminant cases, running a rapid course with death, have been noted in the oculoglandular type. The outbreak comprised four members of a family who became ill within a twenty-four hour period. The symptoms were bilateral in three who died, but unilateral in the fourth, who survived. Death occurred on the sixth, eighth and eighth day of illness, respectively. The infection seemed to have been derived from wild cottontail rabbits. Tularemia was demonstrated by animal inoculation and by cultural and serologic methods in the survivor, but in the three who died laboratory tests were not made either before or after death, owing to the failure of the attending physician to recognize the condition.

Glandular Type.—These are cases in which, after the dressing of rabbits, enlarged epitrochlear and axillary glands develop but in which no lesions on the hands are manifested.

Typhoid Type.—In this type, fever was the only outstanding symptom. For want of a better diagnosis, attending physicians in these cases have inclined to the diagnosis of typhoid until compelled to give it up by reason of a negative Widal reaction and a positive agglutination of *Bacterium tularense*. The onset and duration of the disease in this type are the same as in the glandular types.

Fever is always present in cases of tularemia. Complete temperature records are available only for the laboratory cases, and of these charts there are eleven. Viewing the eleven charts, one is struck at a glance by the constancy of the sequence of initial rise, remission and secondary rise. Following the initial fever, which lasts one, two or three days, there is a remission of temperature for one, two or three days; this is followed by a secondary rise to the original height, after which there is a gradual decline to normal, the whole febrile period lasting from two to three weeks. The early remission of temperature is accompanied by a diminution of all symptoms, and the patient wants to leave the hospital for his home or to return to work, but the symptoms return again with the secondary rise of temperature.

Leukocytosis.—The white cell count is moderately increased and may reach 16,000 but is of no diagnostic value.

Skin Eruption.—A very definite skin eruption, usually bilateral, was noted in thirty-two cases. It was macular, papular, pustular, maculopapular, papulopustular, blotchy, or a rash. In some instances it was painful and inflammatory, but was usually painless and did not itch. Desquamation and pigmented remains have been noted. Many acne lesions developed on the back of the thorax during the illness in two cases. Extreme herpes was noted in one case. Jaundice was observed in one case.

Convalescence.—The convalescence is slow. It is rare for a patient to be at work again at the end of a month. Usually the second month is spent lying about the house owing to weakness on exertion, and during the third month only half-time work is performed. Some have not entirely returned to normal for six months or even a year.

Relapses of fever lasting six and eight days occurred in two laboratory cases after ten and eight months, respectively. Recurring mild attacks of fever have been noted. Suppuration of lymph glands have been noted four, five, six, eight, nine, ten, fifteen, and even twenty-two and twenty-four months after the onset of the disease. Recovery usually occurs without evident sequelae.

Complications.—Appendicitis developed on the fourth day in one case, requiring operation for removal. Ascites, accompanied by symptoms resembling a low-grade peritonitis, appeared in one case three months after onset, and *Bacterium tularense* was isolated from the ascitic fluid. Pleurisy, with effusion into the right chest, developed four and one-half months after onset in one case. Symptoms suggesting pneumonia constitute a bad prognostic sign.

Death.—Of 679 reported cases, twenty-four terminated in death. Bronchopneumonia was the terminal condition in six cases and lobar pneumonia terminated two cases. Severe meningeal involvement was indicated in five patients who manifested delirium and stupor and died in the second week. General peritonitis was noted in two fatal cases, in one of which there was splenic enlargement, diarrhea, hemorrhages, and some ulcerations of the cecum, causing death in the fifth week. A death on the eighth day was preceded by nine stools daily for four days.

Coma, accompanied by albuminuria and casts, was the terminal condition in two patients who died at the end of three and five months, respectively.

DIAGNOSIS

Because tularemia was not borne in mind, the disease has been erroneously diagnosed as follows: 1. Clinicians have called it influenza, septic infection, typhoid and pneumonia. 2. Dermatologists have called it sporotrichosis on account of the subcutaneous nodules. 3. Pathologists have called it tuberculosis on account of the lesions in the lymph glands. 4. Serologists have called it undulant fever on account of the cross-agglutination of *Brucella melitensis* and *Brucella abortus*. On the other hand, serums from eleven cases of undulant fever were received, accompanied by a request that they be tested for tularemia, undulant fever not being in mind.

The clinician who bears in mind the following tetrad will seldom fail to diagnose a case of tularemia: (1) a history of having dressed or dissected a wild rabbit, or of being tick-bitten or fly-bitten; (2) a primary lesion of the skin in the form of a papule, followed by a persistent ulcer or a primary conjunctivitis, followed often by ulcers of the conjunctiva; (3) persistent glandular enlargements in the region draining the primary lesions, and (4) fever of from two to three weeks' duration.

Having recognized this tetrad in his patient, the clinician will prove his diagnosis (1) by obtaining an agglutination of *Bacterium tularense* by blood serum collected in the second week of illness and by noting an increase in the agglutination titer in serum collected a few days later or in the third week, or (2) by isolation of *Bacterium tularense* from guinea-pigs inoculated with material taken as early as the first week from the primary lesion or from the enlarged glands or the blood of the patient. Microscopic examination of cover-glass preparations taken direct from the patient is useless.

Agglutination.—A study of the blood serums of 649 cases of tularemia, tested for agglutination of *Bacterium tularense,* showed the following facts:

1. There was a complete absence of agglutinins for *Bacterium tularense* in the first week of illness.
2. Specific agglutinins were always present at some time in the second week.
3. There was an abrupt rise in the agglutination titer in the third week, which reached its maximum in the fourth, fifth, sixth or seventh week.
4. A fall of titer began in the eighth week.
5. A gradual diminution in the amount of agglutinins took place until at the end of the first year the average titer of twenty-one cases was 1:140.
6. Specific agglutinins remained for years in the blood of long-recovered patients and did not entirely disappear from any case, even ten, eleven, twelve, fourteen, fifteen, eighteen or nineteen years after recovery.

I do not know of any other disease in which an agglutination test will set the diagnosis right in such certain terms after so many years. By the employment of agglutination in conjunction with clinical evidence in fifty-one cases, Simpson[1] reported in June, 1928, a continuous record of the unrecognized existence of tularemia in Dayton, Ohio, throughout the preceding twenty years.

Cross-Agglutination.—Human tularemia serums may show cross-agglutination of *Brucella abortus* (the cause of contagious abortion of animals) and *Brucella melitensis* (the cause of undulant fever). Of 570 human tularemia serums so tested, 129 showed such cross-agglutination, while 441 failed, even in a dilution of 1:10. Many of the latter group were of maximum anti-*tularense* titer (1,280 to 2,560).

As a rule, a tularemia serum agglutinated *Bacterium tularense* in much higher dilution than it agglutinated *Brucella abortus* or *Brucella melitensis,* and the cross-agglutination of the latter organisms was much slower in developing in the water bath. Exceptions to that rule were noted in twelve serums which, after standing in the icebox over night, were found to have agglutinated *Bacterium tularense, Brucella abortus* and *Brucella melitensis* to the same, or to nearly the same, degree.

The significance of these observations, from the point of view of diagnosis, is that a suspected tularemia serum should be tested, not only for agglutination of *Bacterium tularense* but also for agglutination of either *Brucella abortus* or *Brucella melitensis,* unless the clinical history points clearly to the etiology. Evans has established that a serum which agglutinates one of the latter two organisms will also agglutinate the other.

Human undulant fever serums may show cross-agglutination of *Bacterium tularense.* Of ninety-three undulant fever serums so tested, thirty-one showed some degree of such cross-agglutination while sixty-two showed none. Among the latter group were serums which in dilution of 1,280 to 2,560 gave agglutination for undulant fever.

METHOD OF ISOLATING CULTURES FROM MAN

Bacterium tularense has been isolated directly from man by inoculation of culture mediums, by Simpson.[1] The organism has not been identified in cover-glass preparations made direct from man. For ease of isolation, human tissue should first be inoculated into guinea-pigs, rabbits or white mice; culture mediums are then inoculated from these animals after they sicken or die.

1. Simpson, W. M.: Tularemia (Francis' Disease): A Clinical and Pathologic Study of Forty-Eight Nonfatal Cases, and One Rapidly Fatal Case with Autopsy, Occurring in Dayton, Ohio, Ann. Int. Med. **1**: 1007 (June) 1928.

Animal Inoculations.—Pus from the site of the fly bite, tick bite, conjunctiva, other sites of infection, the patient's suppurating glands, or tissue from a wild rabbit's spotted spleen or liver should be injected subcutaneously on the abdomen of guinea-pigs or rabbits. Such material should first be rubbed in a mortar, suspended in salt solution, and strained through coarse gauze. Blood drawn from the patient's median basilic vein is defibrinated, mixed with an equal volume of physiologic solution of sodium chloride and injected intraperitoneally into guinea-pigs. Each guinea-pig should receive from 4 to 8 cc. of the diluted blood.

Cross-Agglutination

Cross-Agglutination by Human Tularemia Serums.

Case	Time After Onset	Bacterium Tularense	Brucella Abortus	Brucella Melitensis	Treatment of Serum
R. R. S.	18 days	640	40	40	Unheated, glycerin
	26 days	1,280	1,280	640	Unheated, glycerin
	7 mos.	640	320	320	55 C. no preservative
	1 year	320	320	320	55 C. tricresol
	2 years	640	160	160	55 C. no preservative
	3 years	320	160	160	Tricresol, then 55 C.
B. F. T.	3 days	0	0	0	Unheated, glycerin
	9 days	80	0	0	Unheated, glycerin
	16 days	1,280	160	320	Unheated, glycerin
	23 days	320	160	160	Unheated, paracresol
	42 days	320	160	160	Unheated, tricresol
	2 years	160	10	10	Unheated, glycerin
E. W. M.	5 days	0	0	0	Unheated, glycerin
	11 days	160	0	0	Unheated, glycerin
	18 days	320	160	160	Unheated, glycern
	25 days	1,280	320	160	Unheated, paracresol
	71 days	320	80	160	Unheated, tricresol
	87 days	320	80	80	Unheated, glycerin
O. P. B.	5 days	0	...	0	Unheated, no preservative
	13 days	160	80	160	Tricresol, then 55 C.
E. W.	17 days	80	80	80	Tricresol, then 55 C.
Cross-Agglutination by Undulant Fever Serums.					
(Dr. B. S. K.)		160	1,280	1,280	55 C.; no preservative
J. B. W.	6 wks.	160	1,280	2,560	55 C.; no preservative
L. W.	1 mo.	160	2,560	2,560	
	7 mos.	80	640	.....	
J. D.		160	2,560	640	56 C.; no preservative
L. F.		80	1,280	320	56 C.; no preservative
H. P.		80	1,280	.....	56 C.; glycerin
D. Z.	1 mo.	80	2,560	.....	Unheated; no preservative
	7 mos.	0	160	160	Unheated; no preservative
W. O.		80	2,560	1,280	Unheated; no preservative
F. H.		320	10,240	5,120	56 C.; tricresol

Within a week the animals should die, presenting a gray, granular caseation of the enlarged lymph glands and great numbers of small white foci of necrosis studded over the enlarged spleen especially, and over the liver. The organs should be viewed in direct sunlight or in strong electric light, because the lesions are often minute. The use of a hand lens may be necessary. In the absence of apparent lesions, the death of the animal is sufficient incentive for transfer to a fresh animal.

Material from the dead animal's glands, spleen and liver, when rubbed on the shaven, abraded skin of another guinea-pig or rabbit, should likewise cause its death within a week with the same typical lesions of the lymph glands, spleen and liver, and thus the infection may be propagated for an indefinite number of passages through guinea-pigs or rabbits.

Cultures of *Bacterium tularense* may be obtained by inoculations of the heart blood, spleen or liver of these animals to coagulated egg yolk or blood dextrose cystine agar. More reliance should be placed on the gross pathologic evidence of the disease in guinea-pigs, rabbits and mice than on cover-glass preparations made from these animals.

Spleens of infected guinea-pigs or rabbits, if dropped into pure glycerol and placed in the icebox, will remain virulent for at least a month, thus affording a means of shipping live virus for identification. Liver is inimical

to the life of the infection and should not be placed in glycerin in the same container with spleen tissue.

Cultures Isolated from Man.—Cultures have been obtained from twenty-four human cases by guinea-pig inoculation, as follows:

1. From blood taken during life from three patients on the third, fourth and sixth days of illness, respectively. From blood taken at autopsy from the brachial vein in one case on the fourteenth day, and from the heart in one case on the eighth day. Blood taken during life after the first week of illness was always negative.

2. From conjunctival scrapings taken from four patients on the fourth, thirteenth, thirteenth and seventeenth days.

3. From pus taken from the nose on the eighth day in a case of the oculoglandular type presenting purulent dacryocystitis.

4. From lymph glands of nine patients taken during life on the fifth, tenth, twelfth, fourteenth, fourteenth, sixteenth, seventeenth, fifty-first and fifty-third days, respectively. Numerous attempts have been made to recover the infection from the pus of lymph glands after the first month of illness, but the results have been usually negative.

5. From the primary lesion on the finger in three cases taken on the fifth, eighth and seventeenth days.

6. From ascitic fluid taken during life, three months after onset.

7. From the spleen taken at autopsy on the eighteenth and twenty-sixth days.

8. In one additional case, cultures were obtained from the finger lesion on the eighth day, from sputum on the twelfth day, and from the following tissues taken at autopsy on the fourteenth day: heart blood, spleen, liver and lungs.

PATHOLOGIC CONDITIONS IN MAN

Acute and subacute lesions are noted in man.

Acute Lesions.—Five, eight, thirteen and fourteen days after onset is the earliest that human tissue collected at autopsy has been sectioned. Lesions were found principally in the primary ulcer, lymph nodes, spleen, liver and lungs. *Bacterium tularense* has not been stained in sections of human lesions.

The primary ulcer showed diffuse necrosis with nuclear fragmentation and infiltration with polymorphonuclear leukocytes, beneath which was infiltration with small lymphocytes.

The lymph nodes showed focal and diffuse necroses made up of leukocytes, débris and nuclear fragments.

The spleen showed, on the surface and throughout the pulp, necrotic foci containing amorphous material, nuclear fragments and a few leukocytes, and bordered by normal splenic pulp.

The liver contained small focal lesions showing necrosis of the hepatic cells, the area being filled with large mononuclear cells, and, where necrosis was advanced, nuclear fragments and polymorphonuclear leukocytes were abundant.

The lung showed plaques or small necrotic foci on the pleural surface. The cut section showed small focal necroses or gray bronchopneumonic patches, or the consolidation involved almost the entire lobe. Microscopically, the alveolar walls showed thickening by edema and by large mononuclear cells, and the alveolar content was composed of a few leukocytes, red cells and a small amount of fibrin.

Subacute Lesions.—Subacuteness approaching chronicity characterizes the later lesions in man. This applies to the primary ulcer at the site of infection, to the regional lymph glands that drain the site of infection, to the subcutaneous nodules in the course of the lymphatics lying between the ulcer and the glands, and to the internal organs—spleen, liver, lymph nodes, lungs and suprarenals.

In microscopic sections, areas of focal necrosis are seen which show a central necrotic zone surrounded by a layer of epithelioid cells and fibroblasts in radial arrangement, and a peripheral zone of lymphocytes, among which are a few giant cells.

The granulomatous type of the subacute human lesions corresponds to the subacute clinical course typical of the disease in man.

Pathologists unfamiliar with the lesions in man have tenaciously clung to the diagnosis of tuberculosis until forced to give it up by their failure to demonstrate acid-fast micro-organisms or to infect guinea-pigs with tuberculosis. In such cases, the rabbit history and serum agglutination have proved the diagnosis of tularemia.

NOTES ON SKIN ERUPTION

1. Parker and Spencer:[2] Red, raised papules were present in one case from the eighth to the twenty-second days. They were about one-fourth inch (6 mm.) in diameter, but some were larger. They appeared first behind the ears, and, spreading, took the form of a band about 3 inches (7.5 cm.) wide across the back of the neck. The eruption gradually extended to the face, sides of the neck and the forehead; it finally appeared on the back of the hands, on the wrists and the fingers, and, to a slight degree, on the forearms and the arms. Peeling and scaling reached its height on the thirty-fifth day.

In another case, a similar eruption appeared on the tenth day on the back of the neck and the forehead and extended to the front of the neck, the hands and the right knee. A few spots appeared on the arms and forearms. There were small pustules on the back and arms.

2. Junkin:[3] Red papules appeared on the fourteenth day on the face, forehead, neck, shoulders and anterior surfaces of the legs. The papules were red and hard but not painful, nor did they itch. The eruption remained twelve days, disappeared for about a week, and then reappeared to a much less degree for three days.

3. Whiteis and Anthony:[4] Numerous purplish spots were present on the neck and chest, and over the body. These were circular and from 0.5 to 1 mm. in diameter, and were slightly raised.

4. Rutledge:[5] A papular eruption began to develop on the sixth day. This was progressive during the second week, and on the twelfth day about 2 dozen papulopustules were distributed over the chest, back, abdomen and thighs, very superficial in their location. Death occurred on the fourteenth day.

5. Netherton:[6] Erythematous papules and plaques appeared on the twenty-fourth day and continued for a week. They developed on the neck, the extensor surfaces of the arms, the dorsa of the hands and the anterior surfaces of the thighs. The lesions were slightly raised, red plaques and reached coin size.

6. Simpson:[1] Two cases were noted: 1. A maculopapular eruption appeared on the tenth day over the upper extremities and the neck. 2. A maculopapular eruption appeared over the scrotum, thighs and abdomen; also nodules along the lymphatics of the arm.

7. Ohara:[7] In one case a transient rash appeared on the face and neck.

8. Flick:[8] Patches of skin eruption developed on the right hand and forehead three weeks after the appearance of the primary lesion of the left conjunctiva.

9. Maclachlan, Fetter and Cratty:[9] Pinhead pustules over both forearms and blotchy reddish spots on the backs of the hands developed on the fourteenth day.

10. Vail:[10] A half dozen large pustules developed between the left eye and the ear in a case of primary infection of the left eye.

11. Ledingham and Fraser:[11] Many acne lesions developed on the back of the thorax in two cases.

12. Verbrycke:[12] Deep jaundice accompanied the symptoms of onset but soon faded.

13. Dr. A. L. L.: A macular eruption appeared on both lower extremities about the fourth day but soon disappeared.

14. Dr. W. S. K.: A red macular eruption appeared over practically the whole body on the fifth day and faded in about ten days.

15. Dr. S. J. W.: Two dime-sized (18 mm.) reddish macules on the thighs were noted on the eighteenth day.

16. Dr. J. E. W.: A blotchy eruption about the neck and a few spots on the cheek and forehead appeared about one week after onset and lasted ten days; this was painful, red, and of an inflammatory nature.

2. Parker, R. R., and Spencer, R. R.: Six Additional Cases of Laboratory Infection of Tularemia in Man, Pub. Health Rep. **41:** 1341 (July 2) 1926.

3. Junkin, H. D.: Two Unusual Cases of Tularemia, Northwest Med. **26:** 415 (Aug.) 1927.

4. Whiteis, W. R., and Anthony, E. J.: Tularemia in Iowa, J. Iowa State M. Soc. **16:** 188 (April) 1926.

5. Rutledge, L. H.: A Fatal Case of Tularemia in Minnesota, Minnesota Med. **10:** 97-99 (Feb.) 1927; abstr. J. A. M. A. **88:** 788 (March 12) 1927.

6. Netherton, E. W.: Tularemia with Reference to Its Cutaneous Manifestations: Report of a Case, Arch. Dermat. & Syph. **16:** 170-184 (Aug.) 1927.

7. Ohara, Hachiro: cited by Francis, Edward: and Moore, Dunlop: Identity of Ohara's Disease and Tularemia, J. A. M. A. **86:** 1329 (May 1) 1926.

8. Flick, J. B.: Tularemia, Ann. Surg. **83:** 737 (June) 1926.

9. Maclachlan, W. W. G.; Fetter, W. J. and Cratty, A. R.: Two Cases of Tularemia, J. A. M. A. **86:**749 (March 13) 1926; Pittsburgh M. Bull., Feb. 6, 1926.

10. Vail, D. T.: Bacillus Tularense Infection of the Eye, Ophth. Rec. **23:** 487, 1914.

11. Ledingham, J. C. G., and Fraser, F. R.: Tularemia in Man from Laboratory Infection, Quart. J. Med. **17:** 365-382 (July) 1924.

12. Verbrycke, J. R.: Tularemia, with Report of a Fatal Case Simulating Cholangeitis, with Postmortem Report, J. A. M. A. **82:** 1577-1581 (May 17) 1924.

17. Dr. C. A. H.: Dark blotches about 4 cm. in diameter appeared over the extremities and body.

18. Dr. T. P. L.: A rash developed early in the disease.

19. Dr. J. H. L.: A red rash developed on the neck.

20. Dr. J. O. B.: A maculopapular eruption appeared on the third or fourth day over the upper extremities and the base of the neck. Raised red blotches with irregular borders were scattered at first, but later they showed a tendency to coalesce and were somewhat painful on pressure.

21. Dr. G. H. H.: Case 1 showed, in the third week, a maculopapular eruption over the forehead, the left side of the face and neck and the dorsum of the right hand. Case 2 showed a pustular eruption early over the face and both arms. The pustules appeared in clusters and left copper-colored pigmentation. This patient also showed, in the third month, a maculopapular eruption on the face, neck, arms and chest.

22. Dr. J. J.: A papular rash appeared on the neck and arms in the sixth or seventh week and was still present in the ninth week.

23. Dr. L. C. P.: A papular rash appeared on the arms, forearms, face and chest about the fourth week of illness and had almost disappeared one month later.

24. Dr. J. B. W.: Wheal-like nodules appeared on the back of the neck, which lasted about five days and then desquamated. A scattered nodular rash appeared on the body, legs, arms, toes, knees, back and neck.

25. Dr. I. R. F.: Hemorrhagic spots appeared on the extremities and the face.

26. Dr. C. N. K.: Papules, some of which became pustular, appeared during the second week and were disseminated over the arms particularly, and on other parts of the body. Some lesions increased in size, were dry and crusty and resembled those of erythema multiforme.

27. Dr. M. C. P.: A pustular eruption was present on the chest and shoulders from the third to the fifth week.

28. Dr. T. B. H. A.: Extreme herpes was noted in one case.

NOTES ON SUBCUTANEOUS NODULES

1. Hodges:[13] Small nodules appeared at intervals on the arm and forearm. They were firm and deep at first. In those which suppurated, the overlying skin was sometimes purplish.

2. Permar and Weil:[14] An indurated nodule 1 cm. in diameter developed near the midpoint of the forearm. There were inflammatory nodules on the flexor surface of the forearm, following the distribution of the lymphatics.

3. McLaughlin and Jones:[15] A chain of subcutaneous nodules developed which extended up the forearm.

4. Epp:[16] Twenty-five or thirty small nodules appeared, which extended from the infected finger all the way up to the axilla. They were firm, tender, and relatively movable. Those which suppurated were incised. Others were also excised.

5. Junkin:[3] Twelve subcutaneous nodules about the size of peas appeared on the seventh day, distributed along the course of the vessels on the anterior surface of the right arm and forearm. They were hard and tender and were palpable for seven weeks. None suppurated.

6. Fulmer and Kilbury:[17] A chain of enlarged lymph glands developed along the extensor surface of the right forearm, which were pea-sized and larger.

7. Freedlander and Grossberg: [18] There was a tender lump on the dorsum of the right hand. Other lumps subsequently appeared on the forearm.

8. Wallace:[19] Small nodules appeared along the inner side of the forearm, with a few on the posterior surface above the wrist. One patient showed a nodule in the middle third of the arm, and another patient showed an abscess in the lower third of the arm quite above the epitrochlear gland.

9. Kavanaugh:[20] Many firm, raised, red nodules the size of a pea appeared about the third week in the skin and extended to the axilla; many of these suppurated. Another patient had multiple nodules of the skin running up her arm.

10. Harper:[21] A small lump on the midforearm and a larger one on the midarm developed. Another patient showed a red streak on the arm, with several lumps along its course.

11. Simpson:[1] Six cases were noted as follows: (1) three reddish painful nodules on the inner surface of the middle third of the right arm; one nodule on the right index finger half an inch above the primary lesion; (2) two nodules along the lymphatics on the inner aspect of the arm; (3) nodules along the lymphatics of the arm; (4) twelve small nodules along the lymphatics of the forearm and a walnut-sized nodule over the inner lower aspect of the biceps; (5) a walnut-sized nodule in the inner bicipital groove was incised, and (6) one nodule on the flexor surface of the left mid-forearm and one on the inner surface of the left arm; both suppurated.

12. Dr. B. S.: Nodular lesions developed on the dorsal surface of the right forearm.

13. Drs. D. and W.: Nodules appeared on the dorsal and median surfaces of the left forearm.

14. Dr. W. L. C.: Raised and slightly red glands appeared in the skin of the arms and forearms which extended to the axilla. There were initial lesions, one on each hand.

15. Dr. D. L. B.: There was an indurated and very tender cord extending to the axilla. Nodules, from the size of a pea to an almond, were scattered in irregular chains, becoming larger and softer as they approached the axilla. There was a primary lesion on one finger.

16. Dr. C. C. P.: Multiple small infected nodes about the size of a pea developed along the superficial lymphatics of the forearm.

17. Dr. C. G. B.: A small nodule developed on the outer aspect of the forearm.

18. Dr. A. G. C.: An indurated subcutaneous nodule appeared on the dorsal surface of the lower third of the forearm. There were nodules on the flexor surface of the forearm.

19. Dr. H. H. A.: There were nodules on the front and the back of the forearm, and a chain on the anterior surface of the arm.

20. Dr. M. I. M.: Nodules the size of a hazel nut were noted, two on the back of the hand and two above the wrist.

21. Dr. S. J. W.: Three pea-sized tender nodes developed on the forearm. The skin was purplish over all the nodes.

22. Dr. E. F. E.: There were enlarged lymphatic glands on the inner anterior surface of the midforearm.

23. Dr. N. J. L.: There were enlarged lymphatic glands on the forearm, arm and axilla.

24. Dr. T. F. W.: Twenty-five or thirty enlarged glands appeared at the times of the chills, mostly on the left side. There was a primary lesion on the left index finger.

25. Dr. O. H. B.: Three glands larger than robin's eggs were noted, proximal to the lesion on the thumb.

26. Dr. W. C. F.: Subcutaneous nodules, extending from the primary lesion on the knee to the enlarged inguinal glands, were slightly tender.

27. Dr. J. E. W.: There were superficial glands, one on the forearm, two on the arm and two on the chest.

28. Dr. F. B. B.: Enlarged tender glands were noted along the forearm and arm, and in the axilla.

29. Dr. W. M. W.: Several small subcutaneous tender nodules developed on the forearm.

30. Dr. H. V. N.: Several small, shotlike, tender subcutaneous nodules appeared on the left forearm.

NOTES ON FATAL CASES

The durations of illness of twenty-four fatal cases have been arranged from the shortest to the longest in the following brief notes:

CASE 1.—Four days, seven hours: Simpson [1] reported the fulminant case of F. W., a negro man, aged 25, a market man, who became suddenly ill Nov. 22, 1927. After dressing rabbits, the patient had developed irregular breaks on the right hand, small nodules along the course of the lymphatics of the forearm, and an epitrochlear and axillary lymph node enlargement. Prior to death there were suggestive signs of localized bronchopneumonia in the right lung—bronchial breathing, fine crepitant râles and impaired resonance—and delirium. *Bacterium tularense* was isolated by guinea-pig inoculation from blood taken ante mortem on the fourth day, and from an axillary lymph node taken at autopsy. Death occurred, November 26, four days and seven hours after the onset.

CASES 2, 3 and 4.—Eight, eight and four days: Freese, Lake and Francis [22] reported the fulminant cases of P. J. L., a farmer, aged 37, his daughter C. L., aged 7, and his son, aged 2. This group became suddenly ill, June 28, 1925, in Lee County, Va., and manifested a bilateral oculoglandular type of symptoms with fever and delirium, and died in stupor on the eighth, eighth and sixth days of illness, respectively. They were buried without necropsy and without specific tests for tularemia having been made before or after death. A common article of food on the family table had been wild rabbits, which the dog had caught in the field.

A fourth member of the family, a girl, N. B. L., aged 6, became ill, June 29, 1925, manifesting a left unilateral oculoglandular type of symptoms, complicated with left purulent dacryocystitis, but she recovered. Swabs of the nose and throat of the sole survivor, taken July 7, and inoculated into guinea-pigs, yielded a culture of *Bacterium tularense*. Blood serum collected from the survivor, August 4, agglutinated *Bacterium tularense* in a dilution of 1:1,280.

CASE 5.—Eight days: Palmer and Hansmann [23] reported the fulminant case of A. R. C., a white woman who, having cut her fingers while dressing a rabbit, became ill three days later, Nov. 12, 1926. Aggravating cough disturbed her for four days. Muttering stupor, fever and respirations of 45 a minute were noted on admission, November 19. Nine stools daily occurred during her last four days. Ulcers on the third and fourth fingers of left hand and enlargement of the left axillary lymph nodes were present. *Bacterium tularense* was isolated through guinea-pig inoculation from the heart blood and axillary nodes. The lower lobes of the lungs showed a mottled gray appearance on a congested background and on section showed intense congestion, several alveoli and an occasional bronchiole being filled with purulent exudate. The bronchopneumonia was described as being inconsiderable.

CASE 6.—Nine days: G. D. B., a man, aged 48, patient of Dr. Nat G. Clark, Ensley, Ala., had dressed a freshly killed rabbit and had developed an ulcer in a briar scratch on the right index finger. Enlargement of the right axillary glands occurred. The blood serum failed to agglutinate *Bacterium tularense* on the fourth and eighth days, but serum taken post mortem on the ninth day, Jan. 1, 1928, was positive (1:20).[24]

CASE 7.—Twelve days: Fulmer [25] reported briefly the death of J. L., a man, aged 54, a farmer, a patient of Dr. C. L. McNeil of Rogers, Ark. The patient became ill, March 6, 1927, after he had dressed rabbits. Death occurred, March 17, with symptoms of general peritonitis.

CASE 8.—Thirteen days: Bardon and Berdez [26] of Duluth, Minn., reported the case of V. B., a white man, aged 53, a farmer. Definite

13. Hodges, F. C.: Three Cases of Tularemia, One Resembling Sporotrichosis, Am. J. M. Sc. **170:** 57 (Aug.) 1925.

14. Permar, H. M., and Weil, G. C.: The Histopathology of the Subcutaneous Lesions in Tularemia in Man, Am. J. Path. **2:** 263 (May) 1926.

15. McLaughlin, A. J., and Jones, W. M.: Tularemia, Bull. St. Louis M. Soc. **20:** (May 20) 1926. Francis, Edward; and Callender, G. R.: Tularemia: The Microscopic Changes of the Lesions in Man, Arch. Path. **3:** 577-607 (April) 1927.

16. Epp, cited by McLaughlin and Jones and by Francis and Callender (footnote 15).

17. Fulmer, S. C., and Kilbury, M. J.: Tularemic Peritonitis, Bull. St. Vincent's Infirmary, Little Rock, Ark. (July) 1927; Tularemia Peritonitis, J. A. M. A. **89:** 1661-1662 (Nov. 12) 1927 (without illustrations or table).

18. Freedlander, S. O., and Grossberg, M. H.: Tularemia, J. A. M. A. **88:** 475-476 (Feb. 12) 1927.

19. Wallace, W. R.: Tularemia with Five Case Reports, J. South Carolina M. A. **22:** 141 (July) 1926.

20. Kavanaugh, C. N.: Tularemia, Report of Seven Cases, Kentucky M. J. **25:** 352-357 (July) 1927.

21. Harper, C. W.: Tularemia: Report of Two Cases, South. M. J. **20:** 459 (June) 1927.

22. Freese, H. L.; Lake, G. C., and Francis, Edward: Four Cases of Tularemia (three fatal) with Conjunctivitis, Pub. Health Rep. **41:** 369 (Feb. 26) 1926.

23. Palmer, H. D., and Hansmann, G. H.: Tularemia: Report of a Fulminating Case with Necropsy, J. A. M. A. **91:** 236-239 (July 28) 1928.

24. Personal communication to the author.

25. Fulmer, S. C.: Tularemia, J. Arkansas M. Soc. **24:** 61-67 (Aug.) 1927.

26. Bardon, Richard; and Berdez, George: Tularemia: Report of a Fatal Case, with Postmortem Observations, J. A. M. A. **90:** 1369-1371 (April 28) 1928.

onset occurred, July 27, 1927, two days after he had cut up the carcass of a rabbit found dead. Cyanosis, semistupor, fever and pulmonary symptoms led to the clinical diagnosis of bilateral bronchopneumonia on admission to the hospital, August 3. An almost hidden ulcer of the left middle finger, very enlarged left epitrochlear glands, lesser glandular enlargements of the left axilla and anti-*tularense* agglutination titer of 1:160 (partial 1:320) established the correct diagnosis. Death occurred, August 9. Sections showed an alveolar pneumonia.

Case 9.—Fourteen days: Rutledge [8] of Detroit Lakes, Minn., reported the case of Mrs. J. H., aged 58. While dressing a wild cottontail rabbit which her husband had shot near her home, she had cut her left thumb. Illness began six days later. The cut developed into a small ulcer and there was a slight enlargement of the epitrochlear and axillary lymph nodes. The general appearance of the patient was very similar to that of typhoid. She became semicomatose on the seventh day, became gradually worse and died, Sept. 10, 1926, on the fourteenth day of illness. Blood serum, collected just after death, agglutinated *Bacterium tularense* in a maxium dilution of 1:320. The clot from the blood specimen was injected into a guinea-pig, causing the typical lesions of tularemia, cultures from which yielded *Bacterium tularense*.

Case 10.—Fourteen days: Bunker and Smith [27] reported the case of J. G. F., a man, a physician, aged 65, who was a patient at the United States Naval Hospital, Washington, D. C. Having dressed rabbits which he had shot, he became ill five days later, Nov. 24, 1927. An ulcer developed on the right thumb and one on the right finger at the sites of thorn punctures. There was a slight epitrochlear and axillary lymph node enlargement of the right side. Influenza was the diagnosis in the first week, but this was changed in the second week to tularemia with bronchopneumonia of the right lower lobe. Sputum was scanty, tenacious, and had a prune-juice tint. Delirium was noted, and the patient died in coma, December 8, fourteen days after onset. *Bacterium tularense* was isolated by guinea-pig inoculation from the finger lesion on the eighth day, from the sputum on the twelfth day, and from the following tissues taken at autopsy on the fourteenth day: heart blood, spleen, liver and lungs.

Case 11.—Fourteen days: Goodpasture and House [28] reported the case of A. T. R., a white man, aged 29, a produce employee who, Nov. 26 and 28, 1927, while dressing rabbits, injured the right index finger with a rabbit bone. Onset of illness occurred, November 29. An ulcer developed at the site of the injury and the right axillary lymph nodes and those of the right supraclavicular fossa became enlarged. Blood serum collected on the fifth day of illness was negative for agglutination of *Bacterium tularense*, but serum collected on the thirteenth day was positive in a dilution of 1:80. Death occurred, December 13.

Case 12.—Sixteen days: J. C. P., a man, aged 43, a farmer, a patient of Dr. W. D. Asbury of Terre Haute, Ind., punctured his thumb while skinning a rabbit. Onset of illness occurred three days later, June 8, 1928. Ulcer of the right thumb developed but search failed to find epitrochlear or axillary lymph node enlargement. Blood serum agglutinated *Bacterium tularense* (1:40) on the twelfth day and (1:160) on the fifteenth day of illness. Agglutination of *B. typhosus* was negative. Five days before death, the patient was in a typhoid state with fever, delirium and some muttering. Death occurred, June 24, 1928, on the sixteenth day of illness.[24]

Case 13.—Sixteen days: W. N., a man, aged 58, a trapper, was a patient of Dr. A. M. Newton of Pocatello, Idaho. Having cut his hand while dressing wild rabbits, he contracted an ulcer on the hand, followed by epitrochlear and axillary lymph node enlargement and accompanied by severe constitutional symptoms, among which was mild delirium. He died, Sept. 1, 1926, sixteen days after the onset. Blood serum agglutinated *Bacterium tularense* in a dilution of 1:40, but higher dilutions were not tested.[24]

Case 14.—Eighteen days: Verbrycke [12] of Washington, D. C., and Francis and Callender [16] reported the case of Mrs. C. S., a housewife, aged 67, a white woman. She became suddenly ill, Dec. 13, 1923, having dressed two market rabbits, December 8, and having punctured her right index finger, December 10, with a wooden splinter, at the site of which an ulcer slowly developed. Jaundice and symptoms simulating cholangeitis were present. Death occurred eighteen days after onset and eight days after an exploratory abdominal incision. Blood serum collected on the sixteenth day agglutinated *Bacterium tularense* in a dilution of 1:80. Cultures of *Bacterium tularense* were obtained by guinea-pig inoculation from spleen tissue taken at autopsy, December 31.

Case 15.—Twenty-three days: J. B. S., a man, aged 58, was a patient of Dr. J. T. Powell of Gravette, Ark. While killing and skinning a woodchuck, he cut the second finger of the right hand, which resulted in a deep suppuration. Influenza was the clinical picture in the second week, and bilateral lobar pneumonia in the third week. Death occurred, June 25, 1927. Blood serum agglutinated *Bacterium tularense* in a dilution of 1:1,280.[24]

Case 16.—Twenty-six days: Francis [29] and Francis and Callender [16] reported the case of R. S., a white man, aged 52, a farmer, who was a patient of Dr. H. L. Charles of Delta, Utah. He had been fly-bitten on the right side of the neck posteriorly, and the right posterior auricular gland suppurated. *Bacterium tularense* was isolated by guinea-pig inoculation from the blood on the fourth day, from the posterior auricular gland on the fourteenth day, and from spleen tissue taken at autopsy twenty-six days after onset. Pneumonia of the right upper lobe, accompanied by much pain and by rusty sputum, existed during the last few days of life.

Case 17.—Four weeks: Anderson reported the case of E. N., a white man, aged 40, who was a patient of Drs. F. F. Doepp and W. G. Glasier of Carlsbad, N. M. July 31, 1924, the patient had used jack rabbit meat for fish bait. Three days later he developed lesions on the hands, and the left epitrochlear gland became enlarged. Organic disease of the heart was evident before and during the attack, the patient having previously been discharged from the army for that cause. Extreme herpes of the lips was noted. Decompensation gradually developed and death occurred about four weeks after the onset of illness.[30]

Case 18.—Twenty-nine days: L. K., a man, aged 24, a farmer, a patient of Dr. H. W. Schumacher of Altamont, Ill., after having dressed rabbits, developed an ulcer on the tip of the left index finger and a swollen gland in the left axilla. Blood collected on the eighth day failed to agglutinate *Bacterium tularense* or typhoid, or the paratyphoids. Blood collected on the nineteenth day of illness agglutinated *Bacterium tularense* in a dilution of 1:1,280 but failed to agglutinate typhoid or the paratyphoids or *Brucella abortus*. During the last ten days there were from six to eight stools daily and intestinal hemorrhages. Death occurred, Dec. 29, 1927. Post mortem there was general peritonitis with plastic exudate covering the abdominal contents. The spleen was very large and there was some ulceration of the cecum.[24]

Case 19.—Thirty-one days: Dr. J. E. Fuhrer, Reliance, Wyo., reported a fatal case in a woman, aged 41, who, after dressing rabbits in the summer of 1926, developed an ulcer on the finger. Her temperature reached normal on the twenty-seventh day, and four days later, when she was sitting up in bed, a precordial pain developed, accompanied by dyspnea, and in twenty minutes she was dead. There were no laboratory tests.[24]

Case 20.—Thirty-four days: T. J. R., a man, aged 66, a patient of Dr. J. T. Powell, Gravette, Ark., had been bitten by a tick and had developed a deep ulcer at the site of the bite, in the left lower posterior axilla. This was accompanied by enlarged left axillary glands. Death occurred, Aug. 13, 1925, thirty-four days after onset. No laboratory tests were made.[24]

Case 21.—Six weeks: B. W. B., a man, aged 31, after having skinned a rabbit which he had shot, became ill, Nov. 15, 1926. An ulcer developed on the right index finger, and the axillary glands suppurated. Five weeks after onset, bilateral bronchopneumonia developed and death ensued six days later. Blood serum agglutinated *Bacterium tularense* ten days after onset in a dilution of 1:160, and four weeks after onset in a dilution of 1:640.[24]

Case 22.—Eight weeks: C. H. W., a man, aged 42, dressed rabbits which he shot, Dec. 22, 1926. He developed an ulcer on the left little finger and an epitrochlear and axillary lymph gland enlargement. During the third to fifth weeks the disease ran a typhoid-like course. Bilateral bronchopneumonia, especially of the lower lobes, developed in the seventh week and death occurred nine days later. Blood serum agglutinated *Bacterium tularense* after two weeks in a dilution of 1:160, and after six weeks in a dilution of 1:320.[24]

Case 23.—Three months: L. B., a man, aged 32, a patient of Dr. John L. Smiley of Siloam Springs, Ark., became ill, Feb. 24, 1927, four days after dressing rabbits. An ulcer developed on the left ring finger. Suppuration of the left epitrochlear and axillary glands required incision. The patient was out of bed in three weeks, and aside from the suppurating lymph glands was feeling quite well up to one week previous to May 6, when albuminuria was noted. May 6 he was in coma and there was general edema and an abundance of albumin and casts in the urine. Blood serum, collected May 6, agglutinated *Bacterium tularense* in a dilution of 1:640. Death occurred in coma, May 19.[24]

Case 24.—Five months: M. C., a negro woman, aged 35, was a patient of Dr. J. H. Wagner at the St. Francis Hospital, Pittsburgh, Dr. A. J. Bruecken, pathologist. This case was reported by Francis and Callender.[16] Careful questioning elicited that the patient had dressed rabbits about New Year's, 1926, but a cut or sore on the hands did not result. January 24, she was admitted, with shortness of breath and pain in the chest. January 29, pneumonia involved the entire right chest and left lower lobe. February 13, an enlarged gland in the left axilla, the size of an egg, was first noticed; this was thought to be secondary to some infection of the breast. March 3, a gland in the left axilla was removed; it was noted as being subpectoral; an abscess was encountered when the mass was dissected; several necrotic and abscessed glands were noted. March 13, the blood serum agglutinated *Bacterium tularense* in a maxium dilution of 1:320. March 20, the patient was discharged, with the incision still unhealed. May 22, she was readmitted in coma, the urine being thick with albumin and showing granular casts and pus cells. She died, May 23, at 12:33 a. m.

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30. Reported to the Surgeon General.

ABSTRACT OF DISCUSSION

Dr. Walter M. Simpson, Dayton, Ohio: A negro market man, aged 25, was admitted to the hospital desperately ill, with a temperature of 106 F., and in delirium. We found multiple fissures of the right hand, ascending lymphangitis and epitrochlear and axillary adenitis. He died twenty-four hours after admission. Just prior to death, we took 10 cc. of blood and inoculated two guinea-pigs and sent a specimen to Dr. Francis. Both of us isolated *Bacterium tularense* from the serum after animal passage. This is the most rapidly fatal case on record. Death occurred four days and seven hours after the first chill. At the autopsy the characteristic lymph node and visceral lesions were found, and the organism was again recovered. An investigation of the market at which this man had worked revealed that eight other rabbit handlers were ill of tularemia. This market had distributed 12,000 Kentucky rabbits in Dayton that week. Within two weeks we had uncovered twenty-five acute cases. We discovered that the market men have known of this disease for twenty-five years. They informed us that they always dreaded the rabbit season because one or two of the best butchers were out of work for several months. As a result of this investigation, we found twenty-eight old cases going back as far as 1908. We demonstrated that tularemia has been present in Dayton for twenty years. Since last November we have found fifty-three proved cases of this disease in Dayton. Besides the fatal case referred to, we have knowledge of six other deaths in Dayton, in all probability due to tularemia. I feel that the number of deaths reported in the literature, approximately 4 per cent, does not adequately represent the true death rate. Every case in our series resulted from direct contact with a wild cottontail rabbit. We were able to demonstrate experimentally that the organism will pass through the unbroken skin of a guinea-pig or rabbit.

We recovered the organism directly from human tissues in two cases. This disease stands unique as the first truly American disease, and the guiding spirit that has made this accomplishment possible is Edward Francis.

DR. C. N. KAVANAUGH, Lexington, Ky.: An epidemic of tularemia occurred in rabbits of Kentucky during 1912; it was not until 1926 that the first cases were reported in human beings. During 1927, more than 125 cases were reported, eighty-nine of which were confirmed serologically. Eighty-three were of the ulceroglandular type, two of the oculoglandular type and four of the typhoid type. Two deaths were reported. Subcutaneous nodules distributed on the forearm and arm extending from the ulcer to the enlarged glands were noted in three cases. Suppuration of these nodules occurred in one case. A definite skin eruption was noted in two cases. During 1926 and 1927, forty-six cases of tularemia, contracted from rabbits shipped from Kentucky, were reported from other states. Two cases of the typhoid type in this series came under my personal observation. To one of these I wish to refer briefly: A man skinned several rabbits. His wife dressed them. Three days later the man developed tularemia of the ulceroglandular type. During the fifth week of the disease, his blood serum agglutinated *Bacterium tularense* in dilution of 1:2,560. Five days after dressing the rabbits, the wife complained of a severe headache, followed by a chill and general bodily aching. On the fifth day of her illness, she complained of an acute lancinating pain in the left side of the chest accompanied by cough and difficult breathing. Physical signs characteristic of lobar pneumonia were present at this time. She continued to have an unproductive cough, frequent chills followed by profuse sweating, and temperature ranging from 101 to 103 F. for a period of six weeks. During the third week typhoid was suspected because of an enlarged spleen. The Widal reaction was negative but the blood serum agglutinated *Bacterium tularense* in dilution of 1:520. During the fifth week of her illness the serum agglutinated *Bacterium tularense* in dilution of 1:1,280 at this time. The temperature dropped by lysis during the seventh week and at this time no physical signs could be elicited in the chest.

DR. EDWARD FRANCIS, Washington, D. C.: Treatment is the subject of greatest interest to most physicians. Rubber gloves afford complete protection to the one who is exposed to infection only occasionally, as in the case of the hunter or cook, or the physician engaged in treating the open lesions of his patient or in performing an autopsy. Prophylactic inoculation of man with killed or nonvirulent organisms has not yet been tried, but it would seem to be a promising procedure, because in man there is a strong and permanent immunity following an attack. Its use would apply especially to those who by occupation must skin, dress or dissect infected rodents, as in the case of market men and laboratory workers. Convalescent serum has not been tried but its use is suggested by the long persistence of agglutinins in a recovered patient and by the lasting immunity. Antiserum obtained from a horse or sheep after injection of these animals with virulent cultures will protect white mice against 10,000 fatal doses of a test culture, provided the antiserum is injected into the mouse at the time of injection of the test culture or within the twenty-four hour period preceding the injection of the test culture, but the antiserum failed to protect mice when injected as late as twenty-four hours after the test culture. Arsenical preparations have been injected in isolated instances in man but the number of such cases is too small to permit a comparison with the favorable results which have often been obtained in patients who did not receive any treatment. In the laboratory, no beneficial result was obtained in rabbits with one well known arsenical. Iodides have been suggested for the late manifestations, such as prolonged enlargement or suppuration of the lymph glands. This is based on their use in other granulomas, but their value, so far as I know, has not been demonstrated. Excision of the lymph nodes during the active stage of the disease has, in most cases, contributed to a relighting of the acute constitutional manifestations, to failure of the surgical incision to close promptly, and to ultimate increased scar formation. In other cases none of these unfavorable results were noted. Incision and drainage are of course indicated at a soft, thin place in the skin overlying the broken-down lymph nodes. Rest in bed is most important.

USE OF FOREIGN PROTEIN IN THE TREATMENT OF PERIPHERAL VASCULAR DISEASES

RESULTS OF INTRAVENOUS INJECTIONS OF TYPHOID VACCINE *

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The keynote in all the researches on vascular lesions of the extremities in recent years has been conservatism. This is particularly true in the presenile type of gangrene now usually classified as thrombo-angiitis obliterans. The palliative trend has been brought about by the progression or recurrence of this disease over a period of years, necessitating in many cases multiple major amputations, which produce individuals with a comparatively long life expectancy who are a total loss to the community. The fact that this malady is practically limited to males in the prime of life emphasizes the importance of therapeutic measures that permit a restoration of function. Among the pioneers who stressed the importance of conservative treatment in these cases, the names of Meyer [1] and Painter [2] stand out preeminently. Rest, elevation, superheated air, hypodermoclysis with large quantities of Ringer's solution daily,[3] intravenous administration of sodium citrate solution,[4] constrictive hyperemia,[5] postural exercises,[6] intravenous administration of sodium iodide,[7] and large quantities of Ringer's solution by duodenal tube,[8] are some of the therapeutic measures found beneficial in the hands of various interested observers. Among the palliative surgical procedures that have been suggested are ligation of the femoral vein (von Oppel and Lilienthal); arteriovenous anastomosis or reversal of the circulation (Wietung); periarterial sympathectomy;[9] sympathetic ramisection,[10] and ligation of the femoral artery.[11] All these procedures, used alone or in combination, have found some favor and many of them are undoubtedly of value. Our personal experience in the past has been largely with Leriche's operation,[12] combined with rest, elevation, superheated air, large quantities of fluids and postural exercises. The necessity for prolonged hospital care and the appalling

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TABLE 1.—*Results of Treatment in Peripheral Vascular Disease*

Case, Age, Sex*	Nationality and Occupation	Symptoms	Pain	Ulceration	Pulsating Vessels	Disability	X-Rays	Oscillometer	Surface Temperature,† F.	Previous Surgery	Surgical Treatment	No. of Typhoid Treatments	Duration of Treatments	Results
						A. Vasomotor Disease								
1 33 ♂	Scotch Mechanic	Attacks of blanching and numbness of fingers of both hands, 3 months; gangrene of tips of two fingers on each hand, 1 month	+	+	+	Complete	Negative	Right wrist, 2.5; left wrist 2.5	74.0	0	0	1	15 mo.	Full-time work; complete relief of pain and ulceration for 13½ months
2 20 ♀	Jewish Stenographer	Attacks of blanching and numbness, cyanosis of fingers of both hands, 2 years	0	0	+	Slight	Negative	Right wrist, 1.3; left wrist 0.4	73.0	0	0	3	1 mo.	Temporary cessation of symptoms after each injection
						B. Obliterative Vascular Disease								
						1. Thrombo-angiitis obliterans								
3 28 ♂	Scotch Electrician	Six years ago, ulcers of first and fifth toes of left foot; healed in 8 months, 1½ years; ulcer, 2 × 1 cm., of right great toe	+	+	0	Complete	Negative	Right ankle 0	76.9	0	0	15	13 mo.	Ulcer healed in 4 months; no pain; full-time work in 9 months
4 30 ♂	Jewish Sheet-metal worker	Intermittent claudication of right leg, 3 months; severe pain in right fourth toe with marked cyanosis, 3 days	+	0	Faint	Complete	Negative	—	78.4	0	0	14	13 mo.	Complete symptomatic relief in 6 months, when peripheral pulsation had entirely ceased and oscillometer reading at right ankle was 0; full-time work in 7 months
5 42 ♂	American Weaver	Symtoms in both legs, 9 years, chiefly right; ulcer, 2 × 1 cm., over heads of third and fourth metatarsals of right foot, 2 years	0	+	0	Partial	Negative	—	84.4	Amputation of first four toes of right foot; ligation of right femoral artery and vein	Gritti-Stokes amputation right leg	6	6 wk.	No improvement in appearance of ulcer in 6 weeks; leg then amputated for economic reason
6 43 ♂	American Shoe worker	Pain on slight exertion in both legs, 5 years, right more than left	+	0	0	Partial	Negative	Right ankle 0	83.0	0	0	11	8 mo.	Marked increase in range of activtity; able to do full-time work shortly after treatment started
7 44 ♂	Finn Mill hand	Pain in both legs on exertion, 9 months; ulcers of left third and fourth toes and infection beneath first toe nail, 2 months	+	+	0	Complete	Negative	Left ankle 0.2	90.6 infection	0	Amputation of first, third and fourth toes of left foot	5	7½ mo.	Two injections before amputation; wounds healed in 2 months; walking well in 6½ months; recently returned to work
8 44 ♂	Jewish Clerk	Pain in right leg, 12 years; left leg, 1½ years; right third finger, 1 year; right great toe amputated for ulcer, 11 years ago; ulcer, 1.5 × 1 cm., over head of right first metatarsal, 2½ years	+	+	0	Partial	Negative	Right ankle 0	74.7	Amputation of right first toe 11 years ago	0	8	7 mo.	Ulcer healed under ambulatory treatment in 6 months; symptoms much improved; works full time in shoe factory now
9 45 ♂	Jewish Clerk	Pain in right leg in walking, 2 years; ulcer of right fifth toe, 1 × 0.5 cm., 1 month	+	+	0	Complete	Negative	Right ankle 0.2	75.7	0	0	5	6 mo.	Marked relief of pain; ulcer now with small draining sinus from osteomyelitis of proximal phalanx, of right fifth toe; patient worked full time during treatment
10 43 ♂	Irish Shoe worker	Symptoms for 10 years in hands and feet; ulcers of both great toes, 6 months	+	+	0	Complete	Negative	—	80.0	0	0	7	3 mo.	Temporary relief of pain and elevation of surface temperature after injections; no improvement in appearance of ulcers
11 37 ♂	Irish Weaver	Pain in both legs on exertion, 4 months; ulcer in left leg; unable to work; pain also at night, unable to sleep	+	0	0	Complete	Negative	Left ankle 0.2	79.6	0	0	7	5 mo.	Immediate and complete relief for 3 months during which time patient did full time work, then developed ulcers on second and third toes of left foot; one healed in 1 month; other healing now; each 1 × 1 cm.
12 38 ♂	Jewish Salesman	Pain in right foot, 2 months; ulcer 0.5 cm. in diameter, on third and fifth toes; area of gangrene on tip of first toe, 1 cm. in diameter; ulcer, 1 × 0.5 cm., over right first metatarsophalangeal joint	+	+	0	Complete	Negative	Right ankle 0	76.4	0	0	6	3 mo.	Ulcer of third toe healed; ulcer of fifth toe practically healed; area of gangrene unchanged; ulcer on dorsum of foot smaller and cleaner; relief of pain for several days after each injection

TABLE 1.—*Results of Treatment in Peripheral Vascular Disease—Continued*

TABLE 1.—*Results of Treatment in Peripheral Vascular Disease—Continued*

Case, Age, Sex*	Nationality and Occupation	Symptoms	Pain	Ulceration	Pulsating Vessels	Disability	X-Rays	Oscillometer	Surface Temperature,† F.	Previous Surgery	Surgical Treatment	No. of Typhoid Treatments	Duration of Treatments	Results
13 30 ♂	Jewish None	Seven years, left leg; 9 months, right leg; two ulcers, 0.5 × 0.5 cm. and 1 × 1 cm., on dorsum of right foot, 1 month	+	+	0	Complete	Negative	Right ankle 0.1; left ankle 0	80.6 81.7	0	Gritti-Stokes amputation of right leg	3	3 wk.	Temporary relief of pain after injections; steady progression of ulceration and gangrene, requiring amputation
14 40 ♂	Italian Laborer	Traumatic ulcer on right great toe, 2 months, 2 × 2 cm.	0	+	0	Complete	Negative	Right ankle 0.1	78.2	0	0	6	2 mo.	Ulcer healed in 2 months; patient walks well with very little discomfort
15 53 ♂	Jewish Tailor	Pain in both legs on walking, 4 years; small ulcer on left great toe, 0.5 × 0.5 cm., 6 weeks	+	+	0	Complete	Negative	Left ankle 0	73.7	0	0	5	6 wk.	Immediate relief of pain; ulcer healed in 2 weeks; full-time work since treatment started
						2. Arteriosclerosis with or without Diabetes Mellitus								
16 64 ♂	American Longshoreman	Traumatic ulcer on left great toe and dorsum of left foot, 4 months	+	+	0	Complete	Calcified vessels	—	88.4 infection	0	Gritti-Stokes amputation of left leg	4	1 mo.	Ulcers healed in 1 month; recurred after another month without treatment; amputation thought best
17 62 ♂	American None	Mild diabetes several years; Gritti-Stokes amputation of left leg 2 years before for gangrene; compound fracture of right femur 3 months ago; compound wound open, nonunion, and six ulcers between thigh and ankle when treatment started; also ulcer 2½ inches in diameter over os calcis	0	+	0	Complete	Calcified vessels	—	—	Gritti-Stokes amputation of left leg	Gritti-Stokes amputation of right leg	8	9 wk.	Compound wound healed and solid union of fracture 1 month after treatment started; six ulcers between thigh and ankle healed in 6 weeks; no change in ulcer over os calcis; amputation 3 inches below site of fracture successful
18 68 ♂	Irish Clerk	Traumatic ulcer over right fifth metatarsophalangeal joint, 9 months; increasing disability	+	+	0	Complete	Calcified vessels	—	—	0	Amputation of right fifth toe and one half fifth metatarsal bone	7	2 mo.	Two injections before operation and five after; wound healed by granulation in 2 months; using foot well in 3 months
19 60 ♂	Irish Politician	Amputation of right leg for gangrene, 3 years before; severe pain in left thigh of few days' duration; rapidly appearing cyanosis in left leg and foot	+	0	0	Complete	Calcified vessels	—	—	Gritti-Stokes amputation of right leg	Gritti-Stokes amputation of left leg	5	6 wk.	Temporary relief of pain after injections; steady progression of disease with death in 6 weeks; two injections before amputation and three after
20 60 ♂	American Drug clerk	Pain in legs on walking, 1 year perforating ulcer between left fourth and fifth toes, 1 month; mild diabetes	+	+	o l. a. t. faint l. p. t.	Complete	Calcified vessels	—	—	0	0	5	2½ mo.	Ulcer healed in 2 weeks; up and about, working in 1 month; no pain
21 57 ♂	Jewish Laborer	Pain in left foot, 2 months.....	+	0	0	Complete	Calcified vessels	Left ankle 0	72.4	0	0	9	4 mo.	Complete relief of pain; sleeps well; walks ½ hour at a time without discomfort
						C. Unclassified Vascular Disease								
22 45 ♀	Jewish Housewife	Cold, reddish purple hands, 5 months....	0	0	Present	Slight	Negative	Right wrist 1.0; left wrist 2.0	70.3	0	0	5	13 mo.	Hands warmer and quite normal in color, with injections about every 3 months
23 45 ♂	Irish Tinker	Blanching, numbness, pain, discoloration of left third, fourth and fifth fingers, 2 months; superficial necrosis and ulceration of tip of left third finger	+	+	+ left ulnar + left radial	Complete	Negative	Right wrist 0.3	70.0	0	0	7	13 mo.	Symptoms slowly disappear, fingers become warmer after two or three weekly injections; able to work for about 3 months, when symptoms slowly return and fingers get cold again
24 21 ♀	Irish Machine operator	Infantile paralysis affecting left leg chiefly 10 years ago; left leg blue and cold with superficial ulcers each winter for past 5 years	0	+	+	Slight	Negative	—	—	Subastragaloid arthrodesis	0	4	5 mo.	Left warmer and better color for about 2 weeks after each injection; no ulcerations this winter
25 37 ♂	French Canadian Laborer	Exposure of hands to cold water for 16 hours 5 weeks before; since then fingers have remained very cold and all nails have separated; superficial ulceration of several fingers	0	+	+ radials 0 ulnars	Complete	—	—	All below 70 F.	0	0	1	1 mo.	At end of 24 hours, temperature of all fingers had risen so that the coldest tip was 82.7 F. and the warmest 92.8 F. at end of 1 month; hands normal and patient able to return to work

* In this column, ♂ indicates male; ♀, female.

† Surface temperatures given refer to tip of coldest finger, in case of the hands, and to the dorsal surface of the base of the first toe in case of the feet. The Pachon oscillometer was used and the readings tabulated were taken at the ankle or wrist, as indicated. The column "pulsating vessels" refers to the dorsalis pedis and posterior tibial or the radial and ulnar arteries of the most affected extremity unless otherwise indicated.

period of disability have brought up many important objections to conservative methods from an economic point of view. On the other hand, the time element involved has emphasized the obvious tendency of this disease to be self-limited in some cases, although a progression or recrudescence seems the rule.

This brings up the question of the mechanism of the disease. There is an obliteration of the main arterial channels, fortunately developing slowly, which allows nature to provide nourishment to the parts involved by means of the collateral circulation, or possibly in some cases by canalization of the occluded main vessels. Meleney and Miller [13] have referred to this as a contest between two conflicting elements. As the main arterial channels become blocked, the collateral circulation must keep pace, developing to an adequate stage, or gangrene takes place, and on this point is based the rationale of all conservative procedures. As to how the disease is brought about is not clear, although there is a considerable evidence that the vasomotor system plays a more important rôle than pure mechanics. We believe that the observations recorded here tend to support this view.

TABLE 2.—*Classification of Cases*

	Vasomotor Disease	Obliterative Disease Thrombo-Angiitis Obliterans	Obliterative Disease Arteriosclerosis	Unclassified	Total
Number of cases treated	2	13	6	4	25
Average age	23.5	40	60	37	
Average duration of symptoms, years	1.1	4.3	0.5	1.4	
Number with ulcerations	1	11	4	3	19
Number with pulsating vessels	2	1	1	2	6
Visible arteries by x-ray	0	0	6	0	6
Subnormal oscillometer readings	1	13	—	1	15
Lowered surface temperature readings	2	8	—	2	12
Number with complete disability	1	10	6	2	19
Minor surgery necessary	0	1	1	0	2
Major surgery necessary	0	2	3	0	5
Average number of treatments	2	7	5	4	
Average duration of treatments, months	8	5.5	1.5	8	
Marked improvement (relieved)	1	5	2	1	9
Improved	1	5	1	3	10
Not improved	0	3	3	0	6
Number with complete disability at time of writing including major amputations	0	4	3	0	7

The difficulties arising in the diagnosis of vascular diseases of the extremities are well known. For these reasons we have adopted the following simple classification in the consideration of the cases we are presenting:

Group A. Vasomotor disturbances.
Group B. Obliterative arterial disease.
1. Thrombo-angiitis obliterans.
2. Arteriosclerosis, with and without diabetes.
Group C. Unclassified.

We feel that some of our cases classified as thrombo-angiitis obliterans are really arteriosclerosis of the Mönckeberg type and, although we have not been able to separate them clinically, one of them has been proved as such on pathologic examination. This type of arteriosclerosis does not always show visible vessels by x-ray in the early stages of the disease, and conforms clinically to the typical picture of thrombo-angiitis obliterans. It also seems unimportant to separate arteriosclerotic gangrene in diabetes from the true senile type. Although these patients may be younger in years, their vascular system has advanced to a point at which the same pathologic state is found as in the aged, and since the advent of insulin they present the same problem for therapy. In the four cases that we were not willing to classify there are elements in each case that fit into two groups. We feel, however, that all these cases probably belong in the group of vasomotor disturbances (table 1, cases 22-25).

Following the suggestion of Brown,[14] we gave small doses of typhoid vaccine intravenously to produce a reaction from nonspecific foreign protein in an effort to ascertain which cases were suitable for palliative operations on the sympathetic nervous system. Early in these experiments we found that these reactions were similar to those seen following periarterial sympathectomy.[12] With the hyperemia there was associated a marked relief from pain and objective appearances of apparent improvement in the local condition of the lesion. It then occurred to us that a repetition of this reaction might be produced at properly spaced intervals with a subsequent healing of ulceration, without the aid of surgical intervention.

During the past sixteen months we have treated a small series of cases representing a variety of peripheral vascular disturbances with repeated intravenous injections of foreign protein in the form of typhoid vaccine. We use the standard vaccine prepared by the bacterio-

TABLE 3.—*Surface Temperatures in Degrees Fahrenheit* *

		Right Hand						Left Hand					
Finger Level	Date	2/13/27	2/14/27	2/24/27	3/2/27	10/16/27	5/12/28	2/13/27	2/14/27	2/24/27	3/2/27	10/16/27	5/12/28
Thumb	(a) Tip	92.6	97.5	91.5	92.3	86.2	77.2	78.0	82.5	86.6	88.0	84.0	72.5
	(b) Base	95.0	99.0	93.0	95.5	91.9	82.6	89.5	92.0	93.0	92.3	95.4	80.9
Second	(a) Tip	76.5	87.5	86.6	89.0	84.0	70.5	74.0	80.0	81.6	89.0	80.5	69.8
	(b) Base	92.0	98.0	93.0	93.0	89.3	76.5	91.5	96.0	90.5	95.0	91.4	78.5
Third	(a) Tip	92.3	95.5	89.5	93.5	88.0	69.4	75.5	82.5	85.0	93.5	88.4	68.8
	(b) Base	93.6	98.5	94.0	94.5	91.0	79.0	90.0	94.0	92.3	93.0	91.0	79.4
Fourth	(a) Tip	76.5	87.0	89.0	92.6	84.0	73.5	84.0	82.0	87.0	92.0	89.3	73.1
	(b) Base	91.0	93.5	93.5	94.5	91.0	81.1	90.0	97.0	92.3	93.0	91.4	79.9
Fifth	(a) Tip	90.0	93.5	91.5	92.3	87.6	76.4	75.3	82.0	92.0	93.5	90.6	74.9
	(b) Base	92.3	98.5	93.0	95.0	91.4	81.8	89.0	92.6	92.6	94.0	91.4	78.1
Dorsal	(a) Base fingers	94.0	94.5	91.5	91.0	88.8	77.6	92.6	94.0	92.3	91.5	89.6	77.0
	(b) Wrist	93.5	93.0	93.5	93.0	90.6	84.2	93.0	93.5	92.3	93.0	90.6	83.3
Temperature, degrees Fahrenheit, (a) Mouth								98.6	103.7	98.0	98.1	98.6	98.1
	(b) Room							69.5	69.9	71.0	79.0	69.0	71.0

* In case 1 showing change in surface temperature over a period of fifteen months, an intravenous injection of typhoid vaccine containing 250 million organisms was given Feb. 13, 1927, after surface temperatures were taken. Following one treatment there was an immediate rise of the surface temperature which was fairly well maintained for more than eight months, since which time there has been a gradual fall in surface temperature associated with some vasomotor disturbances without return of pain, gangrene or loss of function.

13. Meleney, F. L., and Miller, G. G.: Contribution to the Study of Thrombo-Angiitis Obliterans, Ann. Surg. **81**: 976-993 (May) 1925.

14. Brown, G. E.: Treatment of Peripheral Vascular Disturbances of the Extremities, J. A. M. A. **87**: 379-383 (Aug. 7) 1926.

logical laboratories of the state of Massachusetts. It consists of a mixture of typhoid and paratyphoid A and B bacilli, 1 cc. containing 2,500 million organisms.

For the average patient, an initial dose of 0.05 cc. is used. This contains 125 million bacilli. If the subsequent reaction is too severe, less may be given in

Fig. 1.—Potentiometer

future injections. The largest dose we have used is 300 million and the smallest 25 million organisms. The desired reaction is an elevation of mouth temperature of from 3 to 5 degrees Fahrenheit. It is important not to make the reaction too severe, as the patient may not wish to have the treatment repeated. In many of the cases, it is necessary to repeat the injections at frequent intervals over a period of several months' time, before marked benefit is noticed. In patients with definite obliterative disease we usually start with weekly injections and increase the time interval to every month or two months, as the patient improves. We have found that, if the injections are given more frequently than once a week, an equal reaction is not obtained from a repetition of the same dose. If given once a week or less frequently, this amount of protein seems to give approximately the same reaction indefinitely.

The technic of administration is simple. After the vaccine has been thoroughly shaken, the desired amount is drawn into a tuberculin syringe and hypodermic needle, which have been sterilized by boiling. The needle is then introduced into a vein in an aseptic manner; blood is withdrawn to half fill the syringe, and the mixture is injected into the blood stream. A large number of injections have been given in this manner during the past year without any untoward results.[15] The patient is always kept in the hospital under observation during the first treatment. If ambulatory treatment is desired, the patient is allowed to leave immediately after subsequent injections, provided it does not take him more than an hour to reach home.

Several adjuncts to this form of treatment have been used and should be mentioned. Patients are advised to drink large amounts of fluid, to smoke as little as possible, to keep a cradle over their legs while in bed, maintaining a temperature of from 100 to 110 F. within the cradle by electric lights, and to do Buerger exercises three hours a day. While patients are in the hospital this regimen is followed, but they soon give it up when they return home. Although we realize that all of these things are important, we have not insisted on this routine because we wished to judge the effect of foreign protein influenced as little as possible by other measures. In view of past experience with these measures alone, we do not think that they have influenced the results in this series very much, as most of our patients do very few exercises, smoke as much as they please, and do not use externally applied heat.

Following the intravenous injection of typhoid vaccine, a typical and quite constant reaction takes place. First there is a latent period of from half an hour to two hours during which no marked changes are noted. The patient then begins to feel cold, and very rapidly develops a chill which frequently is shaking in nature and may last for half an hour. The extremities feel colder and cyanosis may increase during this period. Preexisting pain often increases to such an extent that morphine is required. Various body aches appear. The temperature then begins to rise and in the course of about three hours reaches its maximum. With the increase in temperature the pain and other uncomfortable sensations become less marked, and the

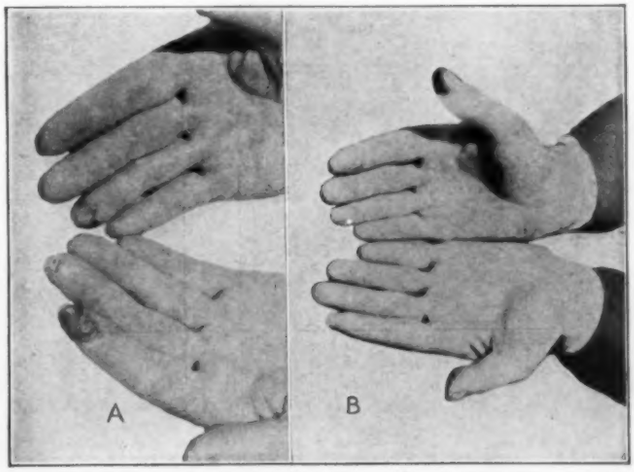

Fig. 2 (case 1).—*A*, condition on admission: Gangrene of terminal phalanges of second and third digitis of left hand and fourth digit of right hand. There was also a small area of gangrene of the second finger of the right hand which barely shows in the photograph. *B*, two months after treatment: complete healing; note slight deformity of the terminal phalanx of index finger of left hand.

extremities become warmer. The color of the hands and feet improves and the patient may complain of a burning sensation as the result of an increase in the temperature of the extremities. The mouth temperature then begins to fall from the high peak quite abruptly, but not as rapidly as it rose, so that in the course of five or six hours it has usually returned to normal. The whole reaction is usually complete within

15. Since the reading of this paper, we have had one patient with arteriosclerotic gangrene of the lower extremities develop thrombosis of the popliteal artery during the early stage of the reaction produced by the intravenous injection of 75 million organisms. We are cognizant of a similar disaster occurring in a neighboring hospital following the sixth injection of 250 million bacilli. Both patients were arteriosclerotic and both required midthigh amputations. The possibility of thrombosis should be seriously taken into consideration before subjecting arteriosclerotic individuals to this treatment. The thrombosis is probably best explained by the slowing of the blood stream during the early stages of the reaction, as indicated by Frank Fremont-Smith (footnote 16).

twelve hours. Occasionally there may be a secondary rise in temperature the following day, and rarely the mouth temperature remains elevated a degree or so for several days. The temperature of the extremities may become elevated as much as 15 degrees F. in severe obliterative disease during the reaction, when the mouth temperature is elevated about 5 degrees. At the end of the reaction, when the mouth temperature is approximately normal, the temperature of the foot is frequently elevated from 5 to 15 degrees F. above its previous level. We have found in several instances that the surface temperature of the foot did not return to its former level for as long as six to eight days after the treatment. Occasionally the surface temperature of the extremity returns to its previous level within twenty-four hours.

Fig. 3 (case 3).—Thromboangitis obliterans: Ulcer of great toe 2 by 1 cm. present for one and one-half years; healed in four months of ambulatory treatment. The crusted appearance of the healed ulcer is due to thickened epithelium.

Fig. 4 (case 8).—Ulcer 1.5 by 1 cm. present two and one-half years; healed after six months of ambulatory treatment.

Dr. Frank Fremont-Smith [16] of Boston has studied the changes in the capillary circulation at the base of the finger nails following repeated administrations of typhoid vaccine, intravenously, in three cases of epidemic encephalitis. By direct observation of the capillaries he has found that during the rise in temperature there is a distinct slowing of the rate of circulation of blood in the capillaries. Along with this, pallor and cyanosis of the fingers and the toes appear. Just before the mouth temperature reaches its height, the capillary circulation is practically at a standstill. It then begins to increase in rapidity, so that when the mouth temperature has reached its maximum the capillary circulation is many times increased over normal, a capillary pulsation beneath the finger nails appears, and the fingers become warm and pink. This situation continues and there is no decrease in the rate of circulation of the blood corpuscles by the time the mouth temperature returns to normal. During the reaction, he has found a uniform fall in the systolic blood pressure of about 20 mm. of mercury, a slightly more marked fall in the diastolic blood pressure, and a corresponding increase in the pulse pressure. We have found the same blood pressure reaction in some cases, in others practically no change, and in still others an elevation and depression of the blood pressure corresponding exactly to the rise and fall of the mouth temperature. Pain may be a factor in causing elevation rather than depression of blood pressure in some cases. That a similar increase in capillary circulation takes place in patients with peripheral vascular lesions seems probable, as evidenced by the clinical improvement and the known rise in surface temperature observed in our cases.

We use a potentiometer (fig. 1) and a copper constantan thermocouple to take surface temperatures. The extremity in question is exposed to the room temperature, which is as near 70 F. as possible, for half an hour. A vacuum bottle filled with cracked ice and water is used as a cold junction. The warm junction, which consists of a fine copper and constantan wire wound and soldered together, is placed on the area of the extremity in question, and the number of millivolts generated in the thermocouple is obtained in a few seconds from the potentiometer. The actual surface temperature is then read from a standard temperature-millivolt scale. The accuracy of the instrument is about 0.3 degree F. It affords a very simple and rapid method of reading surface temperatures which is painless and sufficiently accurate. Our instrument is calibrated to read temperatures from 60 to 110 F.

Fig. 5 (case 14).—Ulcer 2 by 2 cm.; healed in two months: *A*, before treatment; *B*, after one month, and *C*, after seven weeks. Ulcer entirely healed one week after last photograph was made.

Assuming that the surface temperature of an extremity is an index of the blood supply, it is of prognostic value. At a room temperature of 70 F. the surface temperature at the base of the first toe in most normal persons will lie between 85 and 95 F. Extremities with severe obliterative disease under the same conditions will be found to have surface temperatures of from 70 to 80 F. Extremities in a state of gangrene without infec-

16. Fremont-Smith, Frank: Personal communication to the authors.

tion will often have a surface temperature lower than the room temperature. Therefore, we feel that the surface temperature of the extremities, in cases of severe peripheral vascular disturbances, is an index to the adequacy of the blood supply, particularly when the main vessels are completely occluded, as this gives an estimate of the existing collateral circulation. We have seen patients in whom the main vessels of the extremity were completely occluded distal to the lower third of the leg, both to palpation and to oscillometer determinations, whose surface temperatures, at the coldest portion of the foot, were within normal limits and who were essentially symptom free. In the presence of infection, surface temperature readings are of little value. In some cases with patent main vascular channels in one extremity, and obliterated vessels in the other, the surface temperature may be lower in the former than in the latter, although the severity of the symptoms was reversed.

In our routine examination of the lower extremities, we record surface temperatures at certain levels of the dorsum of the foot and anterior aspect of the legs; that is, the base of the first toe, half way to the ankle, the ankle, and the lower and upper thirds of the leg. The readings usually begin to fall within normal limits above the middle of the leg. In cases of upper extremity involvement, we record surface temperatures at the tip and base of each finger on the palmar surface, over the distal end of the metacarpals, and at the wrist joint on the dorsum.

The results in the treatment of twenty-five cases are given in tables 1 and 2. The main difference between groups B 1 and B 2 lies in the fact that, with one exception, case 15, the patients in the former group represent those with well marked vascular disease at an early or middle stage of life without definite evidence of arteriosclerosis clinically. In group B 2, all the patients show definite evidence of arteriosclerosis clinically; they are generally older, and their symptoms are usually of shorter duration.

TABLE 4.—*Surface Temperatures in Degrees Fahrenheit of Right Leg in Case 3* *

	3/27/27	3/28/27	4/2/27	4/1/28	4/21/28	4/20/28
Dorsal Foot:						
Base first toe.....	84.5	89.5	86.6	74.0	76.9	82.5
Midfoot.....	86.6	92.0	90.5	80.9	81.8	87.7
Ankle.....	85.0	92.0	89.0	83.0	80.6	86.2
Leg						
Lower third.....	87.0	91.5	89.0	89.4	85.2	87.8
Upper third.....	87.0	92.0	89.5	91.0	89.2	91.1
Room temperature..	68.8	71.6	72.2	71.5	72.0	72.0
Mouth temperature..	99.1	100.4	99.1	99.0	98.0	99.4

* Intravenous injections of typhoid vaccine containing 125 and 250 million organisms, respectively, were given March 27, 1927, and April 21, 1928, after surface temperatures were recorded. As may be seen, there was continued elevation of temperature for six days after the first injection and a substantial rise twenty-four hours after the injection, April 21, 1928. The fall in surface temperature between March 27, 1927, and April 1, 1928, should be noted. The temperatures of the left leg have changed in a similar manner.

We have tabulated our oscillometer observations whenever possible, so that the results may be compared more accurately with those obtained with other forms of treatment. Silbert and Samuels [17] have classified 124 cases according to the oscillometer, and have found that the prognosis is bad when the reading is less than 0.5 at the ankle. All the patients in group B 1 in our series have marked arterial occlusion and a very poor prognosis, if judged by their classification.

Patient 1 of this series (fig. 2) has shown an interesting change in the surface temperatures (table 3) of the fingers of both hands since his only injections fifteen months ago. Although there is no return of pain or gangrene, he has had a return of vasomotor instability during the past four or five months, and the surface temperatures are now lower than before treatment.

Fig. 6 (case 17).—Circulation of leg and foot adequate before fracture. Extensive ulcerations of leg and foot while patient was confined to bed, which responded to vaccine therapy. This patient had eight injections in nine weeks before amputation. There was marked obliterative vascular disease of both lower extremities with previous amputation of the other leg. It may be possible that the foreign protein treatment was responsible in part for the more adequate collateral circulation in this case, as compared with case 19 (fig. 7).

The surface temperatures (table 3) in case 3, (fig. 3) were recorded over a period of thirteen months. They show a gradual fall, in spite of the fact that the ulcer has remained healed and the patient is doing full-time work. Case 4 also showed a gradual fall in the surface temperature of the feet and a loss of pulsation in the vessels of the right foot, together with marked clinical improvement.

SUMMARY AND CONCLUSIONS

Nonspecific foreign protein in the form of intravenous typhoid vaccine has been used in the treatment of twenty-five cases of peripheral vascular disease. Two of these cases were undoubtedly of vasomotor origin; thirteen were presenile gangrene, clinically thromboangiitis obliterans; six were arteriosclerotic gangrene, including those with associated diabetes, and four, although their chief characteristics would tend to place them in the vasomotor group, showed elements that belong to other groups and have not been classified. The series represents a large majority of far advanced conditions of long standing. Nineteen patients were

17. Silbert, Samuel; and Samuels, S. S.: Thrombo-Angiitis Obliterans (Buerger): Prognostic Value of the Oscillometer, J. A. M. A. **90**: 831-833 (March 17) 1928.

admitted with ulceration; only six had pulsating vessels, and nineteen were completely disabled.

The number of treatments given varied from one to fifteen, over periods varying from three weeks to fifteen months, without deleterious effect on the patient. Of the nineteen patients entering with complete disability, five had major amputations and are included in the group of seven cases considered as unrelieved. Two major amputations we feel now might have been avoided by more prolonged palliative procedures. Twelve out of the nineteen patients with complete disability have been able to return to their former work.

Nonspecific foreign protein (typhoid vaccine intravenously) gives a definite reaction much like that observed following periarterial sympathectomy, with a definite relief from pain and a beneficial change in the appearance of lesions. The reaction can be repeated at

Fig. 7 (case 19).—Thrombosis of femoral artery three weeks before amputation. Two intravenous typhoid injections were made during this period with relief of pain. Circulation of leg and foot was adequate before thrombosis. Note difference in collateral circulation in this case and case 17 (fig. 6). This patient had marked obliterative vascular disease (arteriosclerosis) of both upper and lower extremities, with previous amputation of other leg.

intervals of seven days or more with the subsequent healing of ulcerations. The treatment should be combined with proper hygienic and minor surgical operations when necessary, as it enhances the safety of such procedures.

We believe that the method here described hastens the development of an adequate collateral circulation more effectively than any conservative measures heretofore suggested.

264 Beacon Street.

ABSTRACT OF DISCUSSION

DR. G. E. BROWN, Rochester, Minn.: As Buerger's disease usually involves both legs, and frequently all four extremities, one can see the importance of effective treatment from the economic standpoint. The report of Drs. Allen and Smithwick on the effectiveness of the foreign protein treatment indicates that the former pessimistic attitude is changing. The credit for the first use of foreign protein in the treatment of vascular diseases should be given to Drs. Goodman and Gottesman of New York, who, in 1923, presented a paper suggesting the use of typhoid vaccine in these diseases. We see quite a large number of these cases at the Mayo Clinic. Apparently the disease is increasing in incidence. It is a disease which demands attention, and one that needs careful handling from the standpoint of maintaining these patients at their earning capacity. It affects males exclusively between the ages of 15 and 55, according to our cases. Our results are practically the same as those of Drs. Allen and Smithwick. Fifty per cent of our patients have had complete relief from pain following one injection for from twenty-four hours to three weeks. It may be recalled that the pain in this disease is the factor that frequently determines amputation, a pain which is most terrific and excruciating. The ulcers and gangrenous lesions do not produce systemic symptoms. Morphine, opiates and the usual intravenous medications have no decisive effect. We find that following the induction of protein there is dilatation of the collateral circulation, with both an increased amount of blood in the diseased extremity and an immediate and most striking relief of pain in 60 per cent of the cases. There is one group of patients who come to the clinic with frank gangrene, without hope of relief from palliative measures, in whom we advise immediate amputation. There is a second group in which, in spite of the medical treatment and in spite of the vaccine and all the usual physical measures, the thrombotic process continues to progress at a rapid rate involving successively larger segments of the arteries; these patients will ultimately come to amputation. There remains a fairly large group of patients who, with medical and physical measures and prolonged periods of rest, are restored to the point of maintaining their livelihood.

DR. DAVID STRAUS, Chicago: In 1914 Willy Meyer showed three or four cases in which he used the Koga treatment, which consisted of the use of Ringer's solution subcutaneously daily or every other day, from 500 to 1,000 cc. being injected under the skin with the idea of reducing the viscosity of the blood; in other words, allowing a thinner blood to run through the vessels to help the circulation. I tried out that treatment and reported some cases, and I have used the treatment ever since. It has had, in my hands, a very definite value, but not anything like the results shown here. I have had good results in perhaps a third of the cases, and think that it is a very valuable adjunct. I can see no reason why the treatment submitted by Drs. Allen and Smithwick would not perhaps be aided by the additional use of Koga's treatment; in other words, trying to reduce the viscosity of the blood by the subcutaneous use of Ringer's solution, every other day, say, for about twenty injections. At the Michael Reese Hospital we have given Ringer's solution by mouth, introducing a duodenal tube so as not to have the stomach get all the fluid. In some cases it also has been a valuable way of introducing a larger amount of fluid in twenty-four hours.

DR. ARTHUR W. ALLEN, Boston: We also have tried the administration of large quantities of fluid in thrombo-angiitis obliterans and believe that it is a helpful adjunct to nonspecific foreign protein therapy. We also find that rest, elevation and the postural exercises of Buerger are of great help. We were not satsified with the results obtained by these methods alone, as it was only in the occasional case that a major amputation sooner or later could be avoided. This was also true of periarterial sympathectomy. We do not know, of course, how long these patients who have responded to nonspecific foreign protein will remain well. We do know that some of them now have lower surface temperature readings than they had prior to treatment, although they have remained free from symptoms. It is possible that, once an adequate collateral circulation is established, an occasional treatment with foreign protein might be helpful in the maintenance of sufficient blood supply.

A FEMALE (SEXUAL) HORMONE

MENFORMON AND STANDARDIZED OVARIAN PREPARATIONS

ERNST LAQUEUR, M.D.
AND
S. E. DE JONGH
Director and First Assistant, Respectively, Laboratory of Pharmacotherapy, University of Amsterdam
AMSTERDAM

In concluding his recent article on ovarian therapy, Graves [1] voices the hope that "ovarian extracts, now admittedly feeble and inconstant in their action, will under the direction of research be produced of such potency as to be of constant specific value in the treatment of a limited number of functional pelvic disorders."

From this, as well as from other American publications on the subject, we have gathered the impression that the investigations [2] done in our own laboratory during the last two years have not become widely known. They are based on fundamental and important American research and may be considered a continuation of such research.

Our work led to the preparation of a water-soluble hormone, which in minimal amounts produces strong biologic effects. We gave it a distinctive name to be able to include in its definition a certain degree of purity; i. e., a preparation is named Menformon only if it contains one mouse unit in less than 0.1 mg. of dry substance.[3]

In collaboration with our co-workers, Drs. Borchardt, Dingemanse, Hart, Tausk and Wysenbek, we succeeded in preparing the hormone and determining its properties, but, as said before, only as a continuation of previous American work. We made an extensive use of the test (producing estrus changes in castrated rodents) developed by Stockard and Papanicolaou, Evans, Long, Allen and Doisy and many others; and of the discoveries by R. T. Frank that follicular fluid contains a hormone, and by Allen and Doisy that the hormone can be obtained as an oily extract which shows its activity in the test animals mentioned. This discovery was succeeded by B. Zondek's statement that the proteins may be largely eliminated from the follicular liquid without causing too much injury.

By our "water process" [4] we at first prepared from follicular liquid, and afterward also from other organs a perfectly limpid, absolutely albumin-free solution which might contain up to 1,000 units per cubic centimeter. (The first preparations usually did not contain in excess of from 4 to 10 units per cubic centimeter.) The American reader will perhaps be interested in the important fact that our standardizations agreed very well with those kindly performed on the same samples by Allen and by Doisy. At most our own values were somewhat too low, so that after the American standardization the number of units per cubic centimeter was a little higher.

A. Menformon is characterized by the following biologic and biochemical properties:

1. Menformon produces estrus in castrated rats and mice; the same changes are induced in young immature animals and in senile ones that for many months did not show any spontaneous estrus changes.

2. In all mammals tested up to this time (mice, rats, rabbits, guinea-pigs and dogs), Menformon makes the juvenile uterus, vagina and tubes increase in size. Figures 1 and 2 show, side by side, the uteri from two rabbits and from two dogs; in each case the two animals were from the same litter. Figure 3 is a microscopic section of one uterus horn of each of another pair of rabbits. Out of each pair, one animal was treated with Menformon; the other served as a control and was injected with liver extract and physiologic sodium chloride solution, respectively.

3. Menformon induces growth of the mamma in young females as well as in males: small doses make only the glandular secretory parts grow, whereas with larger doses the external parts,[5] fat tissue and mammilla also increase in size, also in mature males (fig. 4).

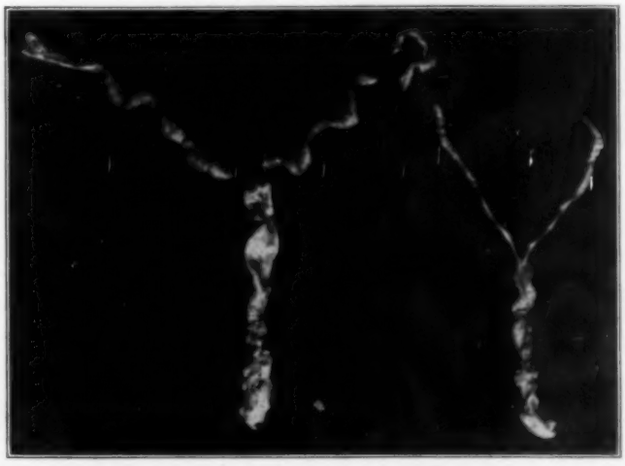

Fig. 1.—Sexual organs of sister rabbits, each weighing 0.65 Kg.: left, organs of rabbit given daily injections of 5 mouse units of Menformon over a period of thirteen days; right, control rabbit, given injections of physiologic sodium chloride solution.

4. Menformon increases metabolism only in castrated female animals, but not in castrated males (fig. 5).

5. Menformon has an antimasculine influence in that the testes, penis, seminal vesicles and prostate of young male animals show considerable retardation in growth (fig. 6); moreover, it is able to produce in mature animals a considerable reduction in the size of the testes (fig. 7).

6. Even when injected for months continuously it is nontoxic; when administered intravenously to a dog, doses of 2,000 mouse units do not in the least alter circulation or respiration (fig. 8).

Properties 2 to 5 are specific in the sense that their action affects only the organs mentioned. Finally, it may be mentioned that the growth of frog larvae may be enhanced by the addition of minimal traces of Menformon to the culture medium.

1. Graves, W. P.: Ovarian Therapy, J. A. M. A. **89**: 1308 (Oct. 15) 1927.

2. Laqueur, Ernst: Deutsche med. Wchnschr. **51**: 1700 (Oct. 9) 1925; **52**: 4 (Jan. 1) 1926; **52**: 52 (Jan. 8) 1926; **52**: 1247 (July 23) 1926; **52**: 1331 (Aug. 6) 1926; **53**: 389 (Feb. 25) 1927; Klin. Wchnschr. **6**: 390 (Feb. 26) 1927; Proc. Roy. Acad. Sc., Amsterdam **28**, 1925; **29**, 1925. Laqueur, Ernst; Hart, P. C., and de Jongh, S. E.: Lancet **1**: 1126 (May 28) 1927.

3. One mouse unit (M. U., adopted in imitation of the rat unit, R. U., first used by Allen and Doisy) is the smallest quantity which, divided in six doses within forty-eight hours, produces symptoms comparable with normal estrus in 75 per cent of the castrated mice injected (at least nine animals out of twelve). The chief symptom is that vaginal smears become positive; i. e., that leukocytes have disappeared and only epithelial cells, mostly without nuclei, are present. The animals must have been controlled, before they are used for any experiment, for at least four weeks after castration; during this time they should give only negative smears, and leukocytes should be present in all of them. After making hundreds of tests, we can say that 1 rat unit is about equal to 4 mouse units.

4. Laqueur, Ernst: Proc. Roy. Acad. Sc., Amsterdam **28**, 1925.

5. Laqueur, Ernst; Borchardt, Eva; Dingemanse, Elizabeth; and de Jongh, S. E.: Deutsche med. Wchnschr. **54**: 465 (March 23) 1928.

B. The physicochemical properties of Menformon are as follows:

1. It is soluble in volatile solvents and in water.

2. Such solutions are all true solutions, for they are dialysable.

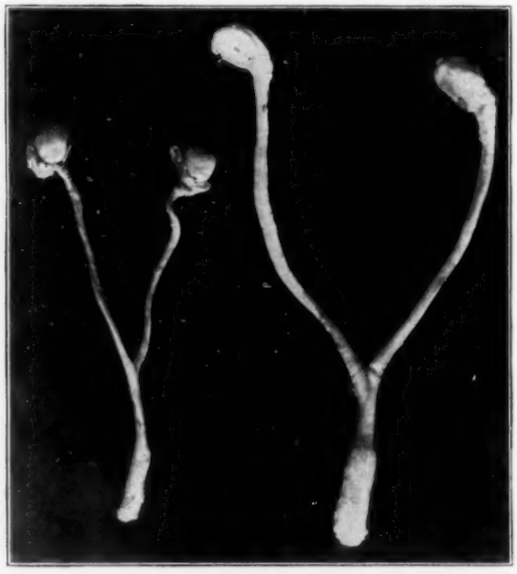

Fig. 2.—Sexual organs of sister dogs, each weighing 4.5 Kg.: left, control animal given injections of physiologic sodium chloride solution; right, organs of dog given daily injections of 30 mouse units over a period of fourteen days.

3. The purer it is, the more soluble it is in water, and the less in volatile solvents. Thus the pure substance is in all probability not a "lipoid" substance (confirming the doubt voiced for the first time by B. Zondek, who based this opinion on transplantation experiments in different parts of the follicular wall).

4. It is adsorbable, but the purer it is, the less it is adsorbed.

5. Menformon is not volatile under the experimental conditions tried to date (under a pressure of 15 mm. of mercury at a temperature of 360 C.).

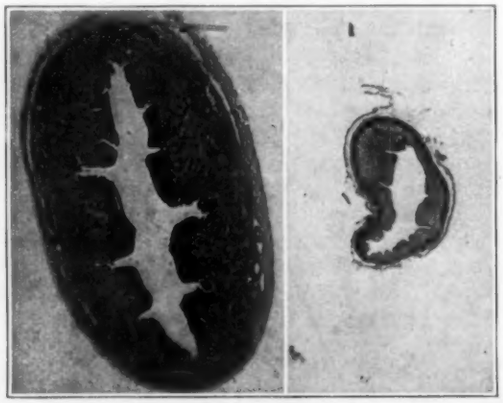

Fig. 3.—Section of uterus horn in sister rabbits: left, in animal given 5 mouse units of Menformon daily for six days; right, in control animal, given sodium chloride solution.

6. It is very resistant toward heat and the action of acids, alkalis, ferments and reducing agents, but it is susceptible to oxidizing agents.

7. Probably it consists only of carbon, oxygen and hydrogen. As a degree of purity of only 0.0003 mg. per unit has been reached, chemical investigations on more impure material can have only a restricted value. We have some reason to expect that the chemically pure Menformon will not differ too much from the best of the present preparations, because the hormones of known chemical structure that in some cases have even been synthesized act in doses of about the same degree of magnitude. A still better comparison is possible with substances that produce a morphologic effect, such as, for instance, vitamins B and D. In regard to these, the action of Menformon is about one to 100 times stronger. For instance, it is sufficient to give a rat an injection of 0.000008 mg. twice daily for four and one-half days, to obtain increased growth of its uterus. This dose is much smaller than that needed to produce estrus. Apart from the scientifically interesting fact that growth is more easily obtained than estrus, this result is practically important because it explains why several preparations, rightly said to

Fig. 4.—Mammae in two pair of guinea-pigs each weighing 500 Gm.; left, in animal given 300 mouse units of Menformon daily for twenty-two days; right, in control animal, given sodium chloride solution.

possess a biologic action, originally showed complete failure when tested according to the method of Allen and Doisy.

Doubtless, Menformon is a true hormone, even according to Biedl's definition, because:

1. It occurs in, and may be prepared from, normal organs (follicular fluid, placenta, amniotic liquid and, curiously enough, even testis).

2. It produces certain effects that also occur in the normal individual.

3. It is present in body fluids apart from the places where it is formed. Till now it has been impossible to isolate it in pure form from blood, though R. T. Frank has been able to show that the blood contains an estrus-producing substance. We ourselves did not attempt its isolation from this source, but we were successful in preparing it from urine following the directions given by Löwe and afterward by Aschheim and Zondek. It seems interesting that it occurs regularly in the urine of males; whether this has any significance and whether constant individual differences occur is a problem still in the course of investigation.

It is not our purpose to dwell here on the physiologic significance of the hormone, its relation to puberty, menstruation and pregnancy, or the number of female hormones.

We think that it is premature to pronounce definite opinions on the unity or plurality of the female hormone. We refrain from discussing its possible importance in the male organism.

The whole therapeutic problem will be brought to a higher level as soon as it becomes possible to make up

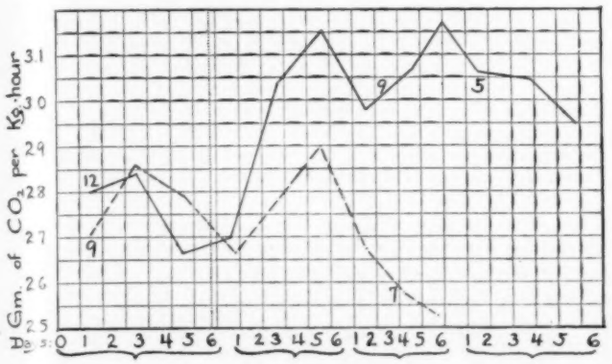

Fig. 5.—Gas metabolism in castrated female rabbits: total average of carbon dioxide production (every point of the curve represents the mean of two successive days). The solid line indicates Menformon; broken line, controls (liver extracts or nothing); dotted line, injection; numerals near curves, number of animals used.

a hormone balance for various individuals, and for patients especially. Urine and perhaps feces analyses, if possible in combination with blood analyses, seem to offer an opportunity for this.

But even before we reach the point of being able to determine the hormone content of each individual, we are justified in expecting therapeutic value of exactly standardized preparations that permit the administration of an exactly known amount of hormone. We use such hypothetic terms, though it is already more than two years since we gave our first water-soluble Menformon preparations to Prof. L. Fränkel of Breslau, after proving on animals that they were quite devoid of any toxic action. Shortly afterward a similar water-soluble nitrogen-free standardized preparation with a somewhat higher but still very low content of solids was

Fig. 6.—Genital organs in male rats, each weighing 35 Gm.: left, organs of control animal given injections of liver extract; right, organs of rat given 3 mouse units of Menformon daily for six weeks.

made and tested by Zondek and others under the name of Folliculin B. Zondek found by means of abrasion that, in a woman with amenorrhea of many years' duration, injection of his preparation produced an evident change of the resting uterine epithelium into a premenstrual one. It is now more than a year and a half since these preparations have been put on the market. To prevent confusion, only one preparation is manufactured on a large scale: this is given the name[6] ovarialhormon folliculin, Menformon.

Menformon is now delivered as a solution containing 40 units per cubic centimeter. But even the previous lower concentration (4 units per cubic centimeter) induced menstruation in a series of carefully observed cases of long standing amenorrhea; in other cases it failed. We ourselves, not being clinicians, think it premature to give statistical data about therapeutic successes, in view of the fact that only a short time has elapsed since substantial daily doses of from 40 to 120 mouse units were initiated. It is the task of the practitioner to show what results may be obtained. He has to solve the most important problem, that of dosage. Endless theoretical discussions are possible but the decision must rest on the results of experiments in human beings. At present, it is our opinion that doses of between 80 and 800 mouse units may prove satisfactory, although Löwe advocates still larger amounts. Our opinion is based on the fact that the increase in the size of the uterus as shown in figures 1 and 2 was

Fig. 7.—Genital organs in male rats, each weighing 160 Gm.: left, organs of control animal given injections of sodium chloride solution; right, organs of rat given 60 mouse units of Menformon daily for four weeks.

obtained in a dog of 4.5 Kg. with 30 mouse units daily, and in rabbits of 600 Gm. with 5 mouse units, although probably the 30 mouse units are not yet the limit dose for such a dog. But even if it should prove necessary in clinical practice to give much larger doses than those mentioned, this may be done without any fear, for even very large doses (2,000 mouse units administered intravenously to a dog) are completely harmless. Moreover, these may be repeated ad infinitum, a fact of the utmost importance in substitution therapy. It is just the merit of such a watery, limpid solution, containing only traces of organic matter, that in contrast with colloidal or even oily solutions it is resorbed at once on subcutaneous injection without leaving any troublesome residue.

CONCLUSIONS

In answer to the demand of Graves for exactly standardized ovarian hormone, we would recommend the standardized, limpid, watery solution of Menformon, whose preparation and development is essentially based on the American discoveries. Menformon has

6. Manufacturer: Organon Limited, Oss (Netherlands) and Degewop Limited, Berlin (Germany).

been in clinical use for two years and a half and for two years it has been available commercially in Europe.

The degree of purity obtained in preparations of Menformon is already considerable (0.0008 mg. per mouse unit in the best preparations). Other points of importance are its solubility in water and its power to dialyze through membranes and to resist various agents. On the biologic side, the most remarkable facts are that Menformon is able to produce true estrus in castrated, immature or senile rodents; to induce growth of the juvenile uterus in all species of mammals observed up to this moment, and to cause development of the secretory as well as that of the external parts of the mammae not only in females but also in males, whether these are castrated or normal. Further, Menformon specifically increases metabolism only in female, and not in male castrates; it has an antimasculine effect in decreasing the velocity of development of the sexual organs in young male animals and in reducing the size of these organs in adult males.

Its occurrence in the blood and urine opens up the possibility of computing a hormone balance for various individuals. Another interesting feature is its presence in small amounts in the testes and in urine of normal men.

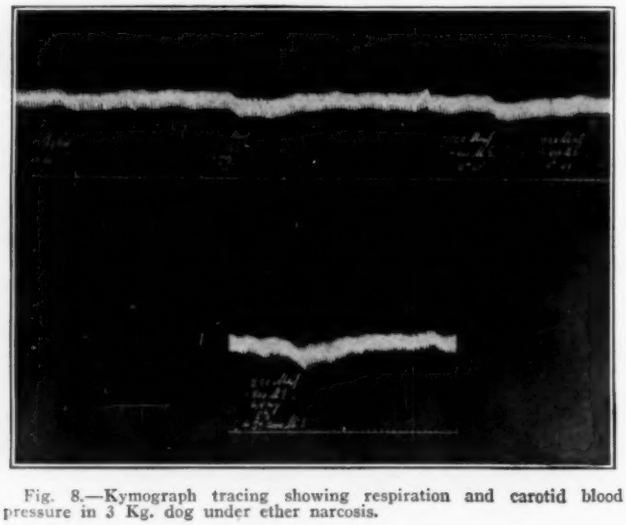

Fig. 8.—Kymograph tracing showing respiration and carotid blood pressure in 3 Kg. dog under ether narcosis.

In view of its perfect harmlessness even when large doses are injected intravenously (up to 2,000 mouse units in dogs), we felt justified in advising the use of Menformon in clinical practice; it may be administered subcutaneously as often as required, as clinical experience has shown that this method of administration is devoid of danger.

Polderweg 20 b/d Linnaeusstraat, October, 1927.

Cancer.—Cancer of the stomach is not often cured. The disease can be removed, and recrudescence prevented, only by surgical treatment. The limits of surgical removal have now been reached, for the whole organ has been extirpated, together with the lymphatic glands attached to it. No further extension of operative methods is possible. The conclusion, therefore, is inevitable that it is to the earlier recognition of the disease that we must now direct attention. The problem, that is to say, is here the same as it is elsewhere: to discover the earliest signs and symptoms of various diseases, so that medical or surgical treatment may arrest their course, and, perhaps, disclose to us the clue to their origins, and enable us at last to prevent their incidence.—Moynihan, Berkeley: Cancer of the Stomach, *Practitioner*, September, 1928.

CHRONIC HEREDITARY EDEMA: MILROY'S DISEASE*

W. F. MILROY, M.D.
OMAHA

The condition now under consideration was first designated by my name by Sir William Osler, in his work on the practice of medicine. The original account of the disease was published in 1892 under the title "An Undescribed Variety of Hereditary Oedema."[1] Six years later Henry Meige, in France, published an account of similar cases. In France and other continental countries the condition is sometimes called "Meige's disease."

My paper gave a definite account of twenty-two occurrences of this edema in six generations of a family consisting of ninety-seven persons. Not long ago it occurred to me that, thirty-five years having elapsed, a new generation of this family had been arriving and it would be interesting to learn whether the family peculiarity was still persisting. After a rather prolonged effort in a follow-up investigation, I found it impossible to secure complete and dependable data. However, I located thirty additional descendants of the family, in the fifth, sixth and seventh generations. Of these only two exhibited the family edema and they were both children of my original patient. It is obvious that the disease is disappearing from this family, quite possibly by reason of attenuation of the taint through marriage with normal persons.

Briefly stated, chronic hereditary edema consists in a firm edema. It is limited in extent to the toes or to a part or the whole of one or both feet, or of one or both legs. It never extends above Poupart's ligament. It is not painful or tender and is without constitutional symptoms. It arises from no apparent cause. Hereditary transmission is conspicuous in its behavior. The edema is permanent, although it subsides to some extent by rest in bed. It occurs in both sexes. It is not inimical to long life, as shown, for example, in the family that I observed. At the time of my report, four of those in the third generation, subjects of the edema, were in good health at the respective ages of 82, 75, 73 and 66.

Since this disease was brought to the attention of the profession its occurrence in a fairly large number of families has been reported by different physicians. Such essential characteristics of the disease as have been mentioned are observed in all of these families. But, as in very many respects the individuals in families resemble one another but differ from other families, so we find variations in detail in reports of these cases. The fact is that each writer has observed only one family, which he is describing, and it would be rather surprising if all reports were identical in every particular. The age of the individual at which the swelling first appears is one of the variations noted. In twenty-one of the twenty-two cases in my family the edema was present at birth. Meige's cases numbered eight affected persons in four generations. He laid stress on the development of the edema at puberty. Hope and French reported thirteen cases out of forty-two persons traced in five generations. In infancy, through childhood to early manhood, the edema first appeared in

* Read before the Section on Practice of Medicine at the Seventy-Ninth Annual Session of the American Medical Association, Minneapolis, June 13, 1928.

1. Milroy, W. F.: An Undescribed Variety of Hereditary Oedema, New York M. J., Nov. 5, 1892.

these cases. Never was it congenital. H. D. Rolleston has given an account of three patients who first developed the edema at about the time of puberty.

Hope and French [2] describe another inconstant manifestation of the disease, which they call "acute attacks," which complicated most of their thirteen cases to a greater or less extent. These are so remarkable that I quote as an example their account of the onset of one of them:

Fig. 1.—Appearance of patient's legs from the front. The deep indentations were caused by a tight bandage, which had just been removed. Without the bandages the legs would shortly become much larger.

> The second "acute attack" began on June 10, 1904. At 6 a. m. the patient had a severe fit of shivering which lasted an hour and a half. She then vomited four times at short intervals, after which she became very hot and experienced severe, continuous pain down her right thigh and leg from Poupart's ligament to the ankle. Her temperature was 104 F., her pulse rate 126 and her respiration rate 52 per minute. The right thigh, leg and foot, beginning sharply at Poupart's ligament, were red, enormously swollen, very hot to the touch, painful, and so tender that any pressure that could be borne failed to cause any pitting. The left thigh and leg felt hot also but they were neither red nor painful and the swelling of the left side was only such as had been present for years. There were no abnormal physical signs in the lungs or in the abdomen. The only abnormal physical sign noted in the heart was a faint blowing systolic murmur, which was heard both at the impulse and at the base; it was thought not to indicate any valvular disease.

The duration of one of these attacks is from two or three days to a week. While the patient may seem to be desperately sick, so far as known the attack has never been fatal. Nothing has been discovered as to the exciting cause of these attacks. They occur absolutely without rule or order. The attack may be repeated every few weeks or at intervals of months or years. The patient may have had the swelling for a few months or a few years or a great number of years before the first acute attack occurs. After the patient has had the attacks repeatedly for a long time they may permanently cease, while the patient, still retaining the swelling, lives for many years enjoying the best of health. Other observers have related the occurrence of similar acute attacks. However, among the twenty-two cases in my family and the eight cases in the family of Meige, the three of Rolleston and others recorded, such attacks were unknown. The relation between the edema and the acute attacks is a mystery.

In the Hope and French family were discovered two feebleminded persons, two epileptic patients, a case of acute mania and a dipsomaniac. Others have noted epilepsy in the family in which the trophedema was found. These observations have suggested a bad nervous make-up as a predisposing cause of the edema. On the contrary, Dr. F. C. Hutchins of Cleveland, writing to me of two cases under her care, mother and daughter, the last two of four generations, remarked that they are very bright, progressive women. The mother was 83 years of age. The family of whom I have written are certainly to be rated above the average intellectually, and their longevity indicates robust health. I have, of course, no intimate information as to most of the 127 individuals included in my studies. I have knowledge, however, of five of them, notable in this connection. The gentleman with whom I first came in contact is a missionary who has for a great many years held a responsible position in Burma. Another member of the family, now deceased, was a clergyman of prominence in Florida. A third was a member of the House of Representatives of the United States. Another was a member of the United States Senate and a fifth was a fine old physician whom I met in Chicago, with bandaged legs at the age of about 80 years. He had been a surgeon in the U. S. Navy during the Civil War. It is my opinion that neither arrested mental development nor a feeble or perverted nervous system is an etiologic factor in this trophedema. Nor does the edema induce enfeebled physical development. The following is from a letter from my original patient. His missionary station is in the mountains of

Fig. 2.—Patient's legs from the side.

Burma, a tropical country. He is a man 6 feet (183 cm.) tall weighing 175 pounds (79.4 Kg.) and is more than 65 years of age. Writing he said:

> During the last twenty-five years I have been able to do an amount of traveling on foot which I think most people who looked at my feet would think impossible. In a single day I have walked as many as 36 miles and that not on the level but up and down mountains, over the roughest paths. Sometimes

2. Hope, W. B., and French, Herbert: Quart. J. Med. **1**, 1907.

in my touring I cover a vertical distance up and down of not less than a mile and occasionally as much as 2 miles in a single day.

I could relate other illustrations of the physical fitness of these people.

Time prohibits discussion of the pathology of this disease. I am not aware of an autopsy ever having been made in one of these cases. My patient told me that he once remained several days in a Chicago hospital for the purpose of having a section of his skin removed and examined. The result was nil. Fernando Rietti [3] published an extensive paper in 1924 in which he said:

Our knowledge of the etiology of Meige's chronic trophedema is exceedingly meager. Some congenital as well as some acquired cases of the condition have been noticed, the latter being mostly secondary to infectious diseases. A number of theories—nervous, lymphatic, vascular and endocrine-sympathetic—have been advanced in an attempt to explain the pathogenesis of trophedema. The author has observed four cases. The author's studies lead him to conclude that trophedema, like other forms of edema, depends on changes of the

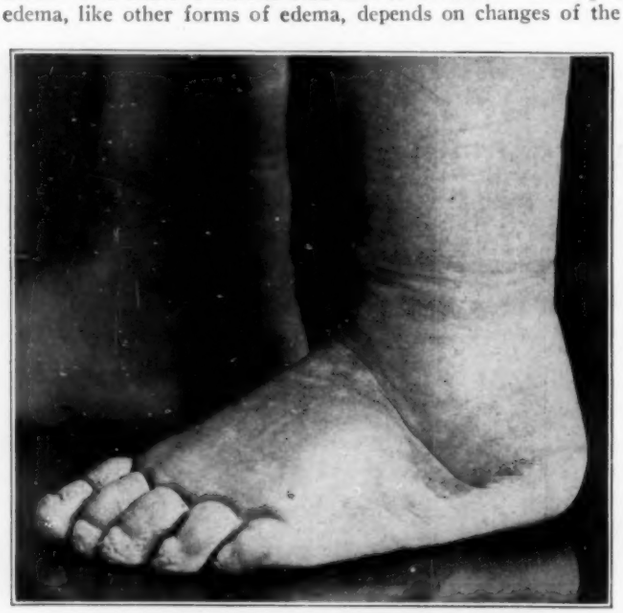

Fig. 3.—Appearance of foot.

various colloids of the body in respect to viscosity and dispersibility; such changes might result from alteration in the function of endocrine organs, particularly the thyroid. Extensive and repeated investigations conducted by the author, on one of the patients in this series, showed that there actually did exist a condition of diminished ability to disperse on the part of the colloids in blood serum (accelerated Kotmann reaction) as well as increased concentration of hydrophil colloids (too high viscosity of the serum as compared with the protein concentration determined by means of Pulfrich's refractometer). In the case studied by the author, furthermore, there was marked alteration in the normal ratio between serum albumin and serum globulin, the latter fraction being by far the higher of the two.

However, it seems probable that there is a local cause for the edema. This might be venous obstruction or thrombosis, lymphatic obstruction, or an error in the activity of the blood vessels or lymphatics dependent on a perverted nerve supply.

Raynaud's disease, urticaria and angioneurotic edema, it is believed, owe their strange existence to vasomotor neuroses. These differ clinically in essential particulars. May not other apparently wholly different and extraordinary manifestations of vasomotor activity occur? It seems very possible that this trophedema is closely allied to the other conditions just named and is another whim of the vasomotor system.

All sorts of internal remedies and local treatment for the cure of this condition have been tried without any benefit whatever. The treatment of the "acute attacks" is symptomatic and palliative. For the edema, firm support by bandage or other appliance is of great value.[4]

468 Brandeis Theater Building.

ABSTRACT OF DISCUSSION

DR. WALTER L. BIERRING, Des Moines, Iowa: We are all impressed with the historical significance of this presentation by Dr. Milroy; to publish an original clinical observation in November, 1892, and then, after a period of more than thirty-five years, to present the subsequent history of the original patient is rather unique in medical contributions. The original character of this observation was appreciated by Delafield, Welsh and Osler, who gave it the name of Milroy's disease by which it has since been generally known in English medical literature. In the reports of further cases, made by Meige, Rolleston, Hope and French, Painter and Bean, and by Higgins, in 1927, the essential clinical characteristics have been maintained as originally described by Dr. Milroy, and the later observers all recognized its familial and hereditary character. The interesting observation is made by Dr. Milroy that it appears to become attenuated, occurring less frequently in subsequent generations, which suggests that marriage with normal persons is gradually weakening the original hereditary taint. The characteristic edema is generally localized in the legs, yet there are no demonstrable signs of venous or lymphatic obstruction. Structural changes in other circulation have not been described. Apparently it does not have a constitutional cause. This painless swelling, while usually observed at birth, has in a few instances first appeared at puberty, or in early adult years. It is generally continuous, with a tendency to increase in extent. An endocrine origin has been considered. Osler was inclined to regard the disease as being closely related to the vasomotor disorders. Rolleston and later writers favor this view. The acute attacks that have been described by French are very suggestive of an intermittent vasomotor disturbance. This periodicity bears a close resemblance to the disorder referred to as intermittent hydrarthrosis. Like Milroy's disease, it is familial and hereditary in character, and with its periodic swellings of joints, beginning at birth or at the age of puberty and continuing through life, it closely resembles a vasomotor disorder. That chronic hereditary edema, or Milroy's disease, is a distinct clinical entity has been well established. It is therefore a matter of congratulation that the original author could come before this section and again present his original case with subsequent historical data. This reflects great credit on American medicine, and will always form a distinct contribution to our knowledge of the subject.

DR. ROBERT H. HALSEY, New York: I have not seen a case of this type of disease. There are, however, five points which seem worthy of study. In the first place, we might study what is called the epidemiology of the disease, such as the time of its occurrence, the age, sex and relationship, and the chief symptoms, including those accompanying the chief symptoms, which might be called complicating symptoms. Such a study should add something definite to the hereditary aspects of the disease. The second point would be to study more carefully the other hereditary conditions in the same patients, such as bronchial asthma, hay-fever, vasomotor rhinitis, angioneurotic edema and eczema, and whether there were certain types of skin or mucous membrane reaction, for these conditions and reactions are said to be hereditary. Conditions of this kind might well be present with the type known as chronic edema. We have not yet seen in the literature of the reported cases that there is a real mendelian, or biologic, hereditary relation. That does not exclude, of course, the possibility that

3. Rietti, Fernando: Chronic Trophedema of Meige (Meige's Disease, Milroy's Disease), Policlinico **31**: 520 (Oct.), 608 (Nov.) 1924.

4. The paper of W. B. Hope and Herbert French (Quart. J. Med. **1**, 1907), so far as I am aware, is the most thorough study of this subject in the English language. A bibliography is given in that paper.

there may be. The third point would be the examination of the basal metabolic rate in every case to determine whether it is above or below what is established as the normal rate. The fourth point should be the study of the presence of epidermal wheal formation to determine the vascular permeability of these persons. These two may be different. Finally we should follow out the suggestions in the work that is being done on the thalamic function to determine whether the trophic centers in the thalamus have control over these conditions which are so definitely defined as bilateral conditions.

DR. W. F. MILROY, Omaha: I shall mention one point which was brought to my notice by a reference to a case reported by Dr. A. F. Slotmann of Kiev, Russia. The diagnosis was chronic trophedema (Meige's disease, Milroy's disease) of the face, intercurrent with menstruation. I requested from Dr. Slotmann full information in reference to his case and since the completion of my paper I have received a reprint of his article together with his comments. The patient was a young woman. The report detailed a most exhaustive scientific study of her condition, which I have not time to relate. A dermoid cyst of the right ovary, tuberculosis of the apex of the right lung and chronic inflammation of all the sinuses of the face were found. The patient suffered periodic attacks resembling the condition of which we have been speaking, but located only in the face. I am not prepared to say whether or not the pathologic condition underlying this case is the same as that in the disease which is the subject of this paper. It would appear not incredible that one or more of the other pathologic conditions present might have an etiologic relation to this swelling of the face. At any rate, barring the swelling, practically all of the essential characteristics of the disease, as we have known it, were absent. It may be when we have learned how to account for the various manifestations of the disease as we have known it in the lower extremities that we shall be able to recognize the same condition if found in other parts of the body.

TUBERCULOSIS OF BARTHOLIN'S GLAND *

WILLIAM D. FULLERTON, M.D.
CLEVELAND

Tuberculosis of the external female genitalia is uncommon, especially when compared to the frequency with which such infection is found in the fallopian tubes, approximately 7 per cent of which, when removed for inflammatory conditions, show tuberculosis on careful microscopic examination.

When the external genitalia are tuberculous, the lesion is usually superficial, involving only the skin or mucous surfaces, or both. The vagina is relatively immune and the urethea, even in the presence of an advanced involvement of kidney and bladder, is very rarely affected.

Inflammation and suppuration of Bartholin's gland is so common, and so frequently due to the gonococcus, that such a reaction is often taken as prima facie evidence of a gonorrheal infection. Infection of this gland is caused by organisms other than the gonococcus, and I have seen quite a few such examples. Marked injustice may be done any woman with Bartholinitis in making a diagnosis of gonorrhea, unless the gonococcus is recovered from the gland or elsewhere from the genitalia.

Tuberculosis of Bartholin's gland unquestionably does occur, though it is rarely recognized and probably often overlooked. In 1925, Gordon [1] reported a case of his own and cited two others, one each by Nogues [2] and Lecene,[3] reported in 1906 and in 1909, respectively. I have been unable to find any reference to other cases, either before or since 1925. Bland [4] refers to streptococcus, staphylococcus and *Bacillus coli* infections of Bartholin's gland, and states that bilateral suppuration highly suggests gonorrhea, though he has seen such condition due to the colon bacillus in virgins. Graves [5] says that infection rarely occurs by organisms other than the gonococcus, and that an infection is almost an unmistakable stigma of gonorrhea. Kelly [6] cites Gordon's case and reproduces his excellent illustrations.

In view of the rarity of this condition, and in order to stimulate more careful observation and diagnosis of common lesions, I have felt that the following case is worthy of reporting:

REPORT OF CASE

A white woman, aged 21, unmarried, seen through the courtesy of Dr. Joseph Placak, who had had her under observation a year for a slightly active pulmonary tuberculosis, complained of a leukorrheal discharge and soreness of the vulva. For the past six weeks there had been some diarrhea, the bowels moving

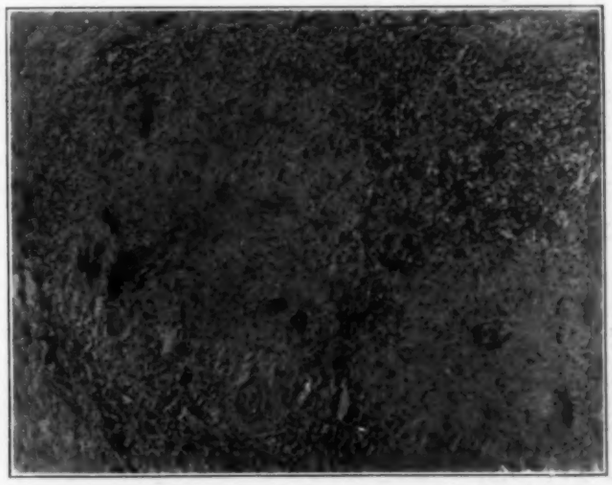

Fig. 1.—Two typical tubercles in the connective tissue; marked peripheral infiltration by lymphocytes; endothelial cells; proliferation marked and many giant cells present.

from four to six times daily, and the stool containing some mucus. About nine months previously, there had been a painful swelling on the left side of the vulva which, after two months, had ruptured spontaneously and gradually healed.

The further past history was unimportant. The menstrual periods began at 15, and were somewhat irregular, occurring every four to six weeks, with a moderate flow for five days, accompanied by some dysmenorrhea.

At physical examination the patient appeared rather poorly nourished, apprehensive and nervous. Dr. Placak examined the thoracic region and reported as follows: The chest was fairly broad and deep. Respiratory excursion was limited on the left side. Vocal resonance was diminished over the upper right side and a trifle increased over the upper left anterior portion. Over the upper lobe the breathing was sharpened, with prolonged expiration on the right side. Over the upper left lobe breathing was bronchovesicular accompanied by fine moist râles. There were no clinical manifestations of cavity. The note in the posterior supraclavicular and interscapular regions was short and high pitched. After expiratory cough there were many fine

* From the gynecologic services of the Lakeside and University hospitals.

1. Gordon, J. W.: Primary Tuberculosis of Bartholin's Gland, J. A. M. A. **84**: 1822 (June 13) 1925.
2. Nogues: Ann. d. mal. d. org. gén. urin. **18**: 421, 1906.
3. Lecene, P.: Ann. de gynéc. et d'obst. **6**: 77, 1909.
4. Bland, P. B.: Gynecology, Philadelphia, F. A. Davis Company, 1924.
5. Graves, W. P.: Gynecology, ed. 3, Philadelphia, W. B. Saunde Company, 1923.
6. Kelly, H. A.: Gynecology, New York, D. Appleton & Co., 1928.

moist râles. After coughing there were a few fine moist râles at the right base.

The further physical examination was negative, except for the pelvis. There were two slightly enlarged and somewhat sensitive glands in the right groin The vulva was covered with a moderate amount of rather thin, grayish brown discharge. There was evidence of acute inflammation. In the region of the right Bartholin gland, a slightly indurated area about 1.5 cm. in diameter, which was slightly sensitive, could be detected on deep

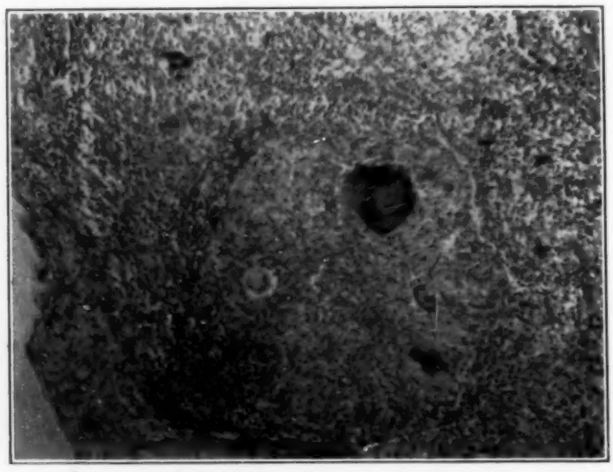

Fig. 2.—A solitary tubercle with diffuse round cell infiltration; endothelial proliferation not so marked as in figure 1; very large giant cell centrally located.

palpation. No discharge from the duct could be expressed. The hymen was unruptured and precluded a vaginal examination. Local cleanliness and a daily douche were recommended.

Two weeks later moderate swelling had occurred in the lower part of the right labium majus, accompanied by considerable discomfort. This swelling and the discomfort decreased before the patient was seen by a physician, but the discharge increased. When examined at this time, the orifice of the right gland emitted a free discharge, which was thin, light brown and watery. Smears and cultures showed only the colon bacillus. The temperature was 37 C.; the pulse, 90; the white blood count, 9,600, and the hemoglobin, 85 per cent. The urine was normal and, with the stools, did not show any tubercle bacilli.

The unusual character of the discharge, the absence of any sign of inflammation, the laboratory observations, the probable presence of tuberculosis in the lungs, and possibly in the bowel, and the virginal state of the patient, all led to the provisional diagnosis of a possible tuberculous infection of Bartholin's gland, and excision was recommended.

Under nitrous oxide anesthesia, a thorough bimanual examination of the pelvis was negative. In the region of the left Bartholin gland a small induration 1 by 0.5 cm. was palpated. No secretion could be expressed from the duct. On the right, a small amount of the discharge described was expressed from the duct and a slightly indurated area 1.5 cm. in diameter palpated. There were none of the usual signs of acute inflammation.

By means of a blunt needle, the duct on the right side was easily injected with a solution of methylene blue (methylthionine chloride, U. S. P.). This materially aided in subsequently identfying the gland tissue. Incision was made through the skin surface over the induration, and free excision of the friable, slightly necrotic mass of tissue was easily accomplished. The wound was closed from the bottom with chromic sutures and a rubber wick was left in the lower angle of the incision. A thorough search was made, but no association or connection with the bowel could be detected. Healing was by first intention and after two weeks only a slight scar could be seen.

The pathologic report by Dr. R. L. Cox was as follows: The sections showed fragments of fibrous connective tissue which were characterized by rich infiltration of endothelial cells and lymphocytes. The latter frequently appeared as rather large focal aggregations and were also frequently arranged peripherally around areas in which was seen marked endothelial cell proliferation. In these areas of endothelial cell proliferation were observed numerous giant cells of the Langhans type. In one section of the tissue was seen a fairly large focal aggregation of polymorphonuclear leukocytes.

The accompanying illustrations, slightly reduced from photomicrographs, with a magnification of 80 diameters, show well the typical tubercle formation with slight secondary infection.

SUMMARY

This case and the other three cases reported show that tuberculosis of Bartholin's gland does occur, either as a primary condition or secondary to tuberculosis elsewhere. The chronicity of the condition, the absence of the usual signs of acute inflammation, the thin watery, clear or brownish discharge and the absence of gonorrheal infection all suggest that the infection is tuberculous.

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CHANGING CONCEPTIONS OF CHRONIC ULCERATIVE COLITIS *

J. ARNOLD BARGEN, M.D.
ROCHESTER, MINN.

The clinical signs and symptoms of chronic ulcerative colitis include a history of frequent rectal discharges of blood, pus and mucus, mixed with feces of variable consistency, depending in a large measure on the extent to which the colon is involved. The ulceration usually begins in the rectum and spreads upward eventually to involve the entire colon. It may, however, affect any part of the colon and occasionally several parts of the colon. Early in the course of the disease, or at a time when the rectum and rectosigmoid only are affected, the stools may be scybalous and surrounded by or mixed with blood; there will also be frequent passages of shreds of bloody pus and mucus, with great desire to strain, and occasionally with griping pain and tenesmus. When all or most of the colon is involved, the stools are liquid or mushy and mixed with mucus, blood and pus. Grueling cramps are not uncommon. Distress from gas, griping and various sensations along the course of the colon are often experienced. A peculiar gray pallor is common, and varying degrees of anemia exist. In the severer cases a morbid body odor prevails. An anxious, rather hopeless facial expression is not uncommon. The patient's lack of bowel control with the feeling that he must remain near a lavatory may account for some of this. Much weight may be lost.

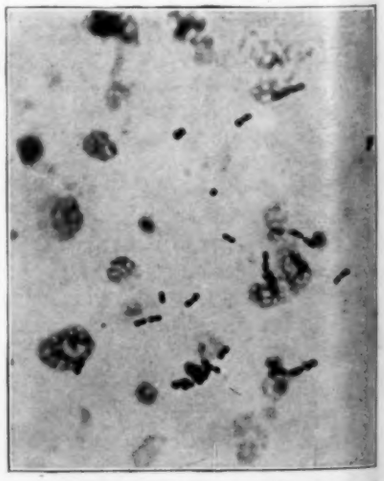

Fig. 1.—The diplococcus of chronic ulcerative colitis.

* From the Division of Medicine, Mayo Clinic.

* Read before the Section on Gastro-Enterology and Proctology at the Seventy-Ninth Annual Session of the American Medical Association, Minneapolis, June 15, 1928.

A septic type of fever occurs in the severe fulminating cases, although a slight elevation of temperature is common in chronic cases. Mild leukocytosis, with polymorphonuclear leukocytes predominating, is the rule. Depleting chronic invalidism occurs rather early in the disease.

ETIOLOGY

In 1924 it was suggested [1] that a diplostreptococcus of definite morphologic, cultural and biologic properties is an important factor in the causation of certain cases of chronic ulcerative colitis. Later studies [1] have confirmed this and have established this organism as the etiologic agent of a definite disease entity (fig. 1).

In 189 cases of chronic ulcerative colitis, the diplococcus was isolated in pure culture. With these strains 459 healthy rabbits were injected intravenously. Evidence of the disease from marked diarrhea to extensive hemorrhages and severe ulceration of the colon developed in 268 rabbits.

In ninety-eight consecutive control cases in which proctoscopic examinations were made and in which the mucosa of the bowel was normal, diplococci in some essentials like those found in cases of chronic ulcerative colitis were isolated from sixteen. Six of these strains were agglutinated by the immune horse serum used diagnostically and therapeutically; only four produced lesions in animals. These lesions were in the form of a few minute, disseminated hemorrhages in the colon.

Other strains of streptococci were frequently isolated. None produced lesions in rabbits similar to those described.

Rosenow,[2] Nickel, Meisser, Hufford, Cook and others, working along similar lines, with similar cultural methods in conditions other than chronic ulcerative colitis with other strains of streptococci in the same laboratory, during the same period, with animals from the same common stock, induced lesions in the colon only in rare instances (not more than 2 per cent). The work of Torrey,[3] Jones,[4] Soper,[5] Fansler,[6] de Bere,[7] MacNaughton,[8] Santee,[9] Portis,[10] Chisholm [11] and others has not only confirmed the foregoing but has added definite data to the knowledge of the etiology of this infection.

The finding of the diplostreptococcus by blood culture in five patients during the last eighteen months seems of utmost significance. Crohn [12] recently reported before the American Gastro-Enterological Association similar observations in two cases of chronic ulcerative colitis.

The significance of distant foci of infection in relation to the etiology of chronic ulcerative colitis cannot be overrated. Predisposing factors for the disease include upper respiratory infections, dental and tonsillar sepsis, overwork, lowering of resistance to infection in any way, and other bowel infections.

Most German writers, until recently, have considered chronic ulcerative colitis as a nonspecific ulceration of the colon. Schur [13] in 1927 expressed the belief that it was a definite disease entity. American writers with considerable experience in caring for such patients and who use the proctoscope expertly are convinced that chronic ulcerative colitis is an infectious disease due to a specific bacterium.

PATHOLOGY

The proctoscopic examination gives the most important data in the diagnosis of chronic ulcerative colitis. Buie [14] and others have described the typical proctoscopic picture. The appearance of the mucosa of the rectum and sigmoid in the four phases of the active period of the disease, namely hyperemia, edema, miliary abscesses and miliary ulcers, is not easily confused with that of any other known lesions of these structures. Again, in the stage of remission or healing, the glazed, contracted, scarred and pitted mucosa is typical. Granular ulceration, pitted scars, and contraction of the lumen of the bowel are pathognomonic proctoscopic signs. The diffuse involvement of the wall of the bowel, mucosa, submucosa and even muscularis is a striking characteristic. With other types of ulceration the mucosa is normal between the ulcers. In chronic ulcerative colitis, myriads of miliary abscesses and ulcers pepper the highly inflamed wall of the bowel. Intense spasm and later scarring contraction produce

Fig. 2.—Typical roentgenograms by barium enema of colon in a case of chronic ulcerative colitis.

1. Bargen, J. A.: Experimental Studies on the Etiology of Chronic Ulcerative Colitis, J. A. M. A. **83:** 332-336 (Aug. 2) 1924; The Treatment of Chronic Ulcerative Colitis, Minnesota Med. **10:** 689-694 (Nov.) 1927; The Medical Management of Chronic Ulcerative Colitis, Tr. Am. Gastro-Enterol. A., 1927, pp. 145-159.
2. Rosenow, E. C.: Studies on Elective Localization: Focal Infection with Special Reference to Oral Sepsis, J. Dent. Research **1:** 205-268, 1919.
3. Torrey, J. C.: Bacteriology of the Human Colon with Particular Reference to Ulcerative Colitis, Tr. Am. Gastro-Enterol. A., 1927, pp. 129-135.
4. Jones, D. F.: The Surgical Treatment of Chronic Ulcerative Colitis, Tr. Am. Gastro-Enterol. A., 1927, pp. 172-179.
5. Soper, H. W.: Chronic Ulcerative Colitis, Ann. Int. Med. **1:** 313-350 (Nov.) 1927.
6. Fansler, W. A.: Chronic Ulcerative Colitis, M. J. & Rec. **126:** 427-430 (Oct. 5) 1927.
7. De Bere, C. J.: Chronic Ulcerative Colitis, Tr. North Chicago Med. Soc., 1928, to be published.
8. MacNaughton, E.: Bacteriologic Studies in Chronic Ulcerative Colitis, Canad. M. A. J. **18:** 568 (May) 1928.
9. Santee, H. E.: Ulcerative Colitis, Ann. Surg. **87:** 704-710 (May) 1928.
10. Portis, S. A.: The Diagnosis and Treatment of Non-specific Ulcerative Colitis, Illinois M. J. **51:** 111-115 (Feb.) 1927.
11. Chisholm, A. J.: Symptomatology and Treatment in Chronic Ulcerative Colitis, Colorado Med. **25:** 28-31 (Jan.) 1928.
12. Crohn, B. B.: Tr. Am. Gastro-Enterol. A., to be published, 1928.
13. Schur, H.: Ueber die Ursachen der Colitis ulcerosa und ihre Behandlung, Wien. klin. Wchnschr. **40:** 756-759, 1927.
14. Buie, L. A.: Chronic Ulcerative Colitis, J. A. M. A. **87:** 1271-1274 (Oct. 16) 1926; Differential Diagnosis of Amebic Dysentery and Chronic Ulcerative Colitis by Proctoscopic Examinations, Surg. Gynec. Obst. **46:** 213-215 (Feb.) 1928.

the characteristic deformity shown in the roentgenogram of a narrowed, nonhaustrated shortened colon (figs. 2 and 3). Even if only portions of the colon are affected the involvement is diffuse, the entire wall being included.

After repeated exacerbations of the disease, the colon gradually becomes denuded of much or most of

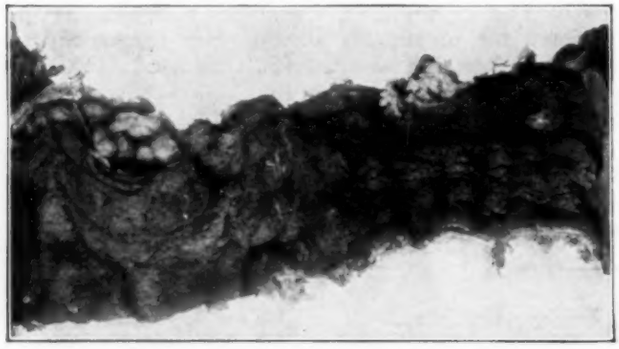

Fig. 3.—A portion of the colon.

the mucosa, so that at necropsy it presents islets of mucosa on which there are typical signs of the disease on a dense granulation tissue base and the whole wall is very thick. In the late stages of the disease, the lower portion of the ileum may be involved. Microscopic sections of such a colon show a thick layer of granulation tissue between studs of inflamed mucous membrane and greatly thickened muscularis and muscularis mucosae. In tissue stained for bacteria by the Rosenow-Gram-Weigert method, myriads of diplococci may be seen (figs. 4 and 5).

COMPLICATIONS AND SEQUELAE

The serious complications of chronic ulcerative colitis include, occasionally, superimposed malignant neoplasms of the islets of mucosa and extensive ulceration. The records of the Mayo Clinic show that twenty such cases were observed from 1916 to 1927, inclusive. Polyposis occurs commonly enough to be of considerable concern. Logan[15] noted it in nineteen of 117 cases; later it was noted in twenty-six of 200 cases. Perforation of the colon and local or generalized peritonitis constitute a serious menace. Rectal stricture and perirectal abscess and fistula associated with chronic ulcerative colitis tax the ingenuity of the clinician. Hemorrhage, mesenteric thrombosis, endocarditis, splenomegaly, tetany, severe anemia and arthritis occur often enough to require caution in the diagnosis and treatment.

Fig. 4.—Section of wall of colon in a case of chronic ulcerative colitis.

15. Logan, A. H.: Chronic Ulcerative Colitis: A Review of One Hundred and Seventeen Cases, Northwest Med. **18**: 1-9 (Jan.) 1919.

TREATMENT

In the light of present knowledge of the etiology of chronic ulcerative colitis, treatment must be directed toward immunization against the causative organism. Early recognition of the disease is imperative. Immunization is attempted in two ways. In the chronic case in which the reserve is not too greatly depleted, a vaccine is prepared by taking a culture of material obtained through the proctoscope. The diplococcus of chronic ulcerative colitis is isolated, and repeated graduated doses of the diplococcus vaccine are administered subcutaneously. Such vaccination usually must be conducted over a period of months. In the acute fulminating case, deep muscular injections of immune serum prepared according to the methods of Rosenow are given.

Another important factor in treatment, based on experimental evidence, is the removal of all possible distant foci of infection. A third important factor in treatment is the diet. In the acute case, liquids of high caloric value are given. The diet is increased with the progress of the disease toward chronicity. In the chronic case a high calory, high vitamin and relatively low residue diet is given.

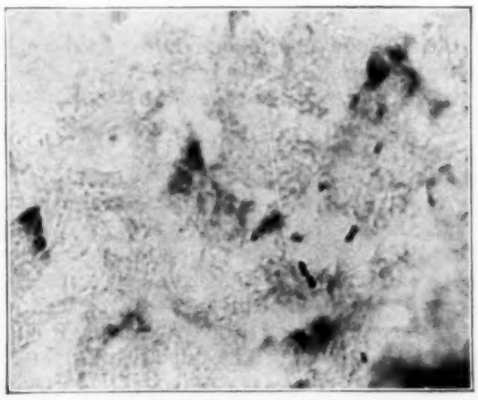

Fig. 5.—Section stained for bacteria, showing diplococci.

The value of mental hygiene in cases of chronic ulcerative colitis cannot be overemphasized. A physician caring for these "toilet-stricken" patients spends much time encouraging them. Rest in bed should be abandoned early. Fresh air, sunshine and mental diversion are valuable assets in the treatment. It is important to encourage the patient to eat; frequent weighing has its purpose.

In order temporarily to reduce bowel emissions, bismuth, kaolin and opium may be used. Hot abdominal stupes and opiates occasionally become necessary because of cramps and tenesmus.

Arsenic given intravenously often aggravates the disease but given by mouth, in some such form as acetarsone, it is beneficial in selected cases. In my experience irrigation of the colon with medicated solutions has yielded disappointing results. In the exceptional case, in which the simpler measures have not been successful, irrigation may be helpful. The treatment of complications is in itself a problem. Surgery rarely becomes necessary under the foregoing regimen. Occasionally, in a resistant case in which the patient is failing progressively, ileostomy may be life saving. Ileosigmoidostomy, except in those rare cases in which the rectum is not involved, cannot be too strenuously

condemned. Cecostomy is of doubtful value. If operation is performed it must be suitable for the individual case.

Table 1 shows the relative success obtained in the management of chronic ulcerative colitis in the Mayo Clinic during the last eight years. Six hundred and fifty-five patients who had not previously reported at

TABLE 1.—*Relative Increase in Cases of Chronic Ulcerative Colitis: Mortality* *

Year	New Patients	Surgical	Mortality: Total Cases	Mortality: Medical: Cases	Mortality: Medical: Per Cent	Mortality: Surgical: Cases	Mortality: Surgical: Per Cent
1920.....	50	21	11	5	17.0	6	28.6
1921.....	49	12	10	4	10.0	5	42.0
1922.....	46	19	10	7	26.0	3	16.0
1923.....	57	21	14	6	17.0	8	38.0
1924.....	63	20	9	6	14.0	3	15.0
1925.....	102	18	17	9	10.0	8	44.0
1926.....	134	19	12	4	3.5	8	42.0
1927.....	154	10	11	5	3.4	6	60.0

* The complete mortality list includes all deaths at the clinic or at home during these years. The medical mortality is figured on the difference between new cases and surgical cases. The surgical mortality is figured according to the number of patients who were operated on and who died in Rochester. In the last three years surgery has been used for complications and as a last resort.

the clinic presented themselves for treatment in the years 1920 to 1927, inclusive. My study was concentrated on the cases observed in the years 1924, 1925 and 1926, because vaccine therapy was begun in 1924 and the cases in 1927 were too recent to be reported.

Of 231 patients receiving vaccine (table 2) in 1924, 1925 and 1926, 168 answered a questionnaire sent to them in April, 1928, by saying that they felt "good," "fine" or "excellent." Forty others said that they were feeling "fair." One hundred and eight of the series were entirely free from bowel symptoms. Sixty-seven said that they were "75 per cent or more" better, twenty-seven said they were "50 per cent" better. Thus 79 per cent of the patients had received definite benefit and 69 per cent were restored to their ordinary usefulness. Seven others said that they were "25 per cent" better, and eleven were not improved. Eleven did not respond to the questionnaire.

For a period of approximately two years vaccine prepared from a number of typical strains of the diplococcus of chronic ulcerative colitis has been sent on

TABLE 2.—*Medical Cases in 1924, 1925 and 1926* *

Condition of Bowel	Cases	Condition of Patient	Per Cent
Free from symptoms.....	108	Clinically well	69
Improved 75 to 90 per cent...	67		
Improved 50 per cent.....	27	Improved 50 per cent.....	10
Improved 25 per cent.....	7		
No benefit	11		
Not heard from.....	11		
Dead	19		
Total	250		

* Results of medical treatment in 250 cases of chronic ulcerative colitis from sixteen to fifty-two months after the beginning of treatment.

request from the Mayo Clinic to physicians who submitted proctoscopic and roentgenologic data in regard to their patients before the vaccine was sent. During the last month a brief report on their results was requested. Sixty-three physicians who had treated ninety-one patients replied. Of the ninety-one patients, fifty-two (57 per cent) were well, twenty-seven were markedly improved, and twelve had not been benefited.

MORTALITY

The ninety-four deaths (table 3) occurred in cases in which a diagnosis of chronic ulcerative colitis had been made in the Mayo Clinic in the last eight years. The patients died either while under treatment at the clinic or at home as a direct result of the disease, its complications or other intercurrent diseases.

COMMENT

The evidence at hand indicates that chronic ulcerative colitis is an infectious disease due to a diplostreptococcus of characteristic morphologic and biologic properties. That it is a definite disease entity is no longer open to question.

The plea for early recognition of the disease, for the use of the proctoscope in all cases of rectal bleeding and for careful roentgenologic investigation by the barium enema in suspected cases of ulceration of the colon should be emphasized. In this way the disease

TABLE 3.—*Causes of Ninety-Four Deaths in Cases of Chronic Ulcerative Colitis (1920 to 1927 Inclusive)*

Medical		Surgical	
Influenzal pneumonia	2	Ileostomy; general peritonitis..	11
Acute ulcerative colitis, perforation and peritonitis.....	6	Ileostomy; emaciation; progressive failure	3
Progression of disease.....	3	Ileostomy; surgical shock.....	2
Lymphatic leukemia	1	Ileostomy; hemorrhage	1
Lymphosarcoma	1	Ileostomy; pulmonary embolism	2
Acute exacerbation; hemorrhage.	1	Ileostomy; carcinoma	2
Acute endocarditis	1	Ileostomy; pulmonary abscesses.	1
Inanition	2	Ileostomy; perforated duodenal ulcer, general peritonitis.....	1
Infectious purpura; hemorrhage.	1		
Acute ulcerative colitis; mesenteric thrombosis	1	Ileostomy; colectomy; pneumonia	1
		Ileostomy; carcinoma of pancreas; pyelonephritis	1
Acute ulcerative colitis; multiple pulmonary abscesses.....	1	Closure of ileostomy; acute exacerbation	1
		Plastic on ileostomy; pulmonary embolism	1
Ileostomy at clinic; death at home later	9	Colostomy; general peritonitis..	3
Carcinoma of stomach.....	1	Colostomy; carcinoma of rectum	5
Ileosigmoidostomy; inanition six months later	1	Colostomy; gangrenous bronchopneumonia	1
		Ileosigmoidostomy; peritonitis..	6
Died at home; cause not stated.	16	Ileosigmoidostomy; lobar pneumonia	1
		Colectomy; hemorrhage	1
		Cecostomy; peritonitis	1
		Appendicostomy; acute enteritis	1
		Hysterectomy for malignant growth; general peritonitis...	1
Total	47	Total	47

can be definitely distinguished from other types of ulceration of the colon and treatment can be instituted early, thus possibly avoiding some of the serious complications.

The treatment of patients with chronic ulcerative colitis is of vital interest to all physicians. It requires patience and careful observation over periods of months. If the patients are not kept under constant surveillance, they drift from one physician to another and often land in the hands of quacks. The treatment should be medical primarily. Surgery should be limited to complications or should be a life-saving measure for the patient who is failing progressively or who fails to improve after long continued treatment.

ABSTRACT OF DISCUSSION

DR. EDWARD G. MARTIN, Detroit: Dr. Bargen's experimental work and clinical observations should be accepted, at least until they are disproved, since they offer the most tangible hope that has been afforded us. In our laboratory at the Harper Hospital in Detroit, we have been able to recover a gram-positive diplococcus that we have called "Bargen's bug," and at times we have found it in almost pure culture. We

must look to experimental therapeutics and drugs for treatment rather than to vaccines; yet, again, I believe the technic of vaccine administration to be most essential. Dr. Bargen has mentioned several auxiliary methods of treatment that have been of value. His vaccine report is encouraging if remissions can be eliminated. Some recurrences seemed to depend on foci of infection that are present in the rectum, and particularly in the anus. The anal region, that little part, an inch and a half long, that is commonly overlooked and obscured by instruments for examination, I believe harbors the infection quite commonly; and Dr. Bargen states that it begins low in the rectum and anus in about 97 per cent of the cases. That has been my observation in the few cases I have seen. We should be more careful in examinations to find anal crypts and to look for submucous tracts, anal papillae, small and large polypi, and abraded hemorrhoids; these are potent sources of retained infection.

Dr. Frank Smithies, Chicago: I regard persons with ulcerative colitis, "spastic colitis" or "irritable colon" as being, constitutionally, in the spasmophilic group. To me, the recurrences of their ailment represent the results of the ordinary "trigger mechanism" such as we are familiar with in asthma, croup and allied diseases. The excitant of this trigger mechanism may be psychic, dietetic or infectious or the result of direct irritation of the bowel by its contents. This aspect of the ailment has not been studied sufficiently. However, it should be studied because these patients, as Dr. Bargen has pointed out, when under the most ideal regimens of treatment have recurrences. Next, I regard the exhibition of pathologic conditions in the colon as localized allergic responses. This allergic phenomenon should be emphasized, particularly in view of the common use of the phrase "immunization by vaccines." I consider that vaccines act as "desensitizers" and not as "immunizers." I am not ready to admit that chronic ulcerative colitis is caused only by the bacterium described by Dr. Bargen. I believe that I can describe a series of patients in whom the results of treatment without the employment of "specific" vaccines or serums have been just as satisfactory as were those which Dr. Bargen has presented today. Among my recent patients are some whom he and his associates have had under their care. Now, how shall we define the term "cured"? We may alleviate certain motility defects and make patients comfortable by means of vaccines, diet, bismuth, irrigations and physical and psychic rest, but in real instances of the disease there still remain organic injury, ulceration, fibrosis, malformation, obstruction and the like. Hence, these persons, I think, are never possessed of a normally functioning colon. Knowing this, we should be very careful not to promise too much. I cannot subscribe to Dr. Bargen's point of view. His vaccine has a place, but it cannot be classed as a specific curative agent for chronic ulcerative colitis.

Dr. H. W. Soper, St. Louis: Laboratory studies of our cases of ulcerative colitis of the nonspecific type showed only a small proportion in which the Bargen organism could be positively identified. In by far the greater number, nonhemolytic streptococci and *Bacillus coli* predominated, and all were treated with vaccine prepared from autogenous cultures. In some of these, there was a striking improvement of a distressing symptom, but no definite change in the general condition. The fact that recurrences are seen again and again suggests that immunity in this disease is either slight or transitory. I believe that the best that can be done at present in nonspecific ulcerative colitis is to treat its effects locally with antiseptics, astringents and stimulants by enemas, irrigations, instillations and topical applications through the proctoscope, not neglecting, of course, any constitutional treatment which has been found useful. These promote drainage, remove products of infection, prevent absorption of toxic material and make the patient more comfortable. My experience has been that most of these patients will in time be relieved. Nevertheless, Dr. Bargen is to be congratulated for his attempt to put the treatment of this serious disease on a scientific basis.

Dr. Arthur A. Landsman, New York: Laboratory studies of our cases of nonspecific ulcerative colitis showed only a small proportion in which Dr. Bargen's bacillus could be identified. In the larger number, *Bacillus coli* predominated, but regardless of this, they were treated with vaccine prepared from autogenous cultures. In some of these there was a striking improvement of the most distressing symptoms but no definite change in the general condition. Recurrences were seen again and again, and this suggests that immunity in this disease is slight or transitory. The treatment of nonspecific ulcerative colitis which offers the best hope of relief in the present state of our knowledge seems to be the use of various antiseptics, astringents and stimulants by instillation, irrigation and topical application through the proctoscope. This prevents absorption, promotes drainage and reduces toxic symptoms. Any general measures, recent or old, based on an intelligent foundation should be given a fair trial. It is my experience that, if these lines are followed, most of these cases will be relieved in time.

Dr. Anthony Bassler, New York: I agree with Dr. Bargen that this disorder is infectious, but I cannot subscribe to the theory that the gram-positive diplococcus is the agent in any generalized sense. I ask Dr. Bargen to explain what has happened to the diplococcus in cases seen at postmortem in which there are no diplococci in the stools, and no diplococci in the submucosa, only streptococci being found. I ask Dr. Bargen to explain why it is that in 60 per cent of normal persons who do not have ulcerative colitis the gram-positive diplococcus is recovered from the stools. Why is it that in 500 vein taps in nonulcerative conditions for Kahn and Wassermann tests there were nine positive cultures of diplococcus and other organisms which I believe were derived from the intestinal canal? I subscribe to what Dr. Smithies has said as to a constitutional factor. Mainly, however, I believe that we deal with a symbiotic bacteriologic factor which is the major etiologic factor. This factor may be varied, and the intermittence of the symptoms of this disease can be explained on the basis of its peculiar pathologic manifestations. If one studies each case long enough, one will find that in all there is a normal mucosa, then a congested mucosa at times, at other times a real inflammatory condition in the mucosa, and at other times ulceration. It is not uncommon to find frank diarrhea during the simple phases of congestion and inflammation without ulceration. There might even be distinct constipation with a great deal of ulceration at the time. I think, as Dr. Bargen does, that the condition is more a medical than a surgical problem, but I cannot agree that there is any specific reaction to any worth while vaccine method, excepting possibly, as Dr. Smithies has said, in a desensitizing sense.

Dr. E. H. Drake, Portland, Maine: I treated a patient with vaccines which Dr. Bargen sent us. I was unable to obtain a culture of the streptococcus from this patient because I did not have Dr. Bargen's technic. The patient was 30 years of age, and had been sick eighteen months when she entered the hospital. She had a severe type, involving the entire colon, including the cecum, and she had lost 40 pounds (18 Kg.). The patient was put on a varied diet without roughage, including all the vitamins. Dr. Bargen sent me some vaccine which I began to use when she had a temperature of 102 F., leukocytosis, and from fifteen to twenty stools daily. She had already had her tonsils removed and had only a few remaining teeth that were normal on roentgen-ray examination. During the course of the treatment, the fever subsided and the stools decreased in number until there were one or two a day. Following the remission in temperature and the return of stools to normal, the remaining teeth were extracted, although they did not show any evidence of decay; however, on extraction they did show evidence of root infection. Five months have elapsed since the last remission, but there is no return of haustrations in the intestine and the mucosa is still friable. The patient feels better than she ever has since the beginning of the disease, and there is hope that there may not be a return of symptoms.

Dr. J. A. Bargen, Rochester, Minn.: There is no experimental evidence of the allergic nature of chronic ulcerative colitis but there is much experimental evidence of the specific infectious nature of the disease. Some patients do not get well. I believe that if proctoscopic examination were resorted to early, and the diagnosis made early, a great many more remissions would be produced. I believe that we should still

call them remissions because, although a considerable number of patients have not had a recurrence for four years, which is certainly extraordinary as compared with their previous condition, it is too soon to decide that they are cured. It should be added also that 20 per cent of the patients had return of haustra of the colon when they had not had haustra when treatment was begun. Many patients coming back for check-up have an entirely normal mucous membrane. Another large number of them retain the so-called granular appearance of the mucosa in which Buie has so adequately described the "foot prints" of the disease; that is, myriads of tiny scars left by minute ulcers which were there during the active stage of the disease. In answer to the suggestion that the old method of treatment of irrigation must be continued, I have only this to say: We obtain much better results by simply removing the foci, giving vaccine, and feeding the patient than we did when we used irrigation. Concerning the diet there is much to be said, particularly in the light of Dr. Larimer's recent work. He feeds these patients on high vitamin diets. We have for years urged patients to eat good nourishing food with high calory and high vitamin values and relatively low in residue. I wish to emphasize that in eighty-nine consecutive cases in which the rectal mucous membrane was normal and in which, for reasons other than chronic ulcerative colitis, proctoscopic examination was made, a similar organism was found in only sixteen, and in only four lesions developed in the bowels of rabbits. These were only minute scattered hemorrhages entirely different from the hemorrhages and lesions found in the colons of rabbits injected with diplococci isolated from patients with chronic ulcerative colitis. In cases coming to necropsy, the diplococcus was in the rectal lesion. Chronic ulcerative colitis is an infectious disease. Our treatment at the present time offers patients much more than formerly.

THREE MILLION DEAFENED SCHOOL CHILDREN

THEIR DETECTION AND TREATMENT: FURTHER DATA*

E. P. FOWLER, M.D.
AND
HARVEY FLETCHER, PH.D.
NEW YORK

Two years ago, before this association, we[1] read a paper having the same title. A practical and rapid method of finding deafened school children was described, and the results of testing the hearing of children in several large schools in New York City were given. Also, a tentative outline was formulated for the management and treatment of such children, medically and educationally.

After a year's interval, the children in one of these schools (enrolment, 1,171) were again similarly tested. This paper gives an account of the results obtained in the second tests, and compares them with those first obtained last year. Although the results indicate that we should somewhat modify our statements with regard to the magnitude of the number of deafened children, they show even more conclusively the necessity of making yearly examinations and of following the deafened patients from year to year.

The equipment used, customarily referred to as the "complete outfit," consisted of the 4-A audiometer and five receiver holders making possible a test of forty children at one time. With the fullest cooperation of the authorities at the school, the survey with this audiometer was conducted in two and one-half days; 1,171 children were examined and all were retested who were found to be below the standard, which was set, as in 1926, at 9 sensation units. The results in table 1 include for comparison the figures for 1926.

From inspection of these results it would appear that the number of deafened children in 1927 was less than in 1926, and hence that conditions were improved for some reason or reasons to be determined. Table 2, however, points out that a large number of children tested in 1926 were not avaliable for the test in 1927 because of their moving from the school district, promotion, sickness and so forth, and hence that the majority of children found deafened were new subjects.

TABLE 1.—*Results of Survey with Audiometer*

	1926	1927
Total number of children tested	836	1,171
Percentage* of total		
Passed as normal hearing in the first audiometer test	79.5%	82.4%
Found to be normal in hearing in the retest of those failing in the first test	13.1%	12.7%
Failed to pass in both tests—deafened	7.4%	4.9%

* All the percentages refer to the total number tested. In 1927, of 100 per cent minus 82.4 per cent, or 17.6 per cent (206) of the children who failed to pass the first test, 149 passed the retest. This number is 12.7 per cent of the total number examined as shown, but it is also 72 per cent of the number of those tested twice. This points out the necessity of the retest.

Audiograms were made by the 2-A audiometer of all the children indicated as being deafened. As previously indicated, only thirty-three of these could be compared to the results obtained last year. However, a comparison of these audiograms reveals some interesting facts, concerning both the method of selecting the deafened children and the changes occurring in their hearing ability and in the physical condition of their ears.

Of the eleven children who are indicated as being deafened both in 1926 and in 1927, eight have audiograms which show only minor changes during the year but indicate very definite hearing defects. All were suppurative ears—recurrent, chronic or healed. In two instances our diagnosis was changed from otitis media catarrhalis chronica in 1926 to otitis media suppurativa healed in 1927. In the two nerve deafness cases, the bone conduction was diminished notably in the higher frequencies. A masking noise was employed to eliminate the sound from the opposite ear. These audiograms are given in figure 1. Most of these children will probably remain in the deafened class, although it seems reasonable to expect that some could be greatly aided by proper medical treatment. In the remaining three cases (out of the eleven) the hearing loss is considerable and audiograms show that it became worse during the year.

TABLE 2.—*Inability to Retest Children the Second Year*

Of 62 children selected as deafened in 1926,	
23	(more than one third) were transferred, or promoted to other schools during the year
4	(about 7%) were suspended for illness
2	were not permitted by their parents to take the test
Total 29	not available for testing in both years
In 1927, of the 33 available children (selected as deafened) of the 62,	
18	passed the first audiometer test
4	passed the retest
Total 22	
11	failed in both tests
33	

* Read before the Section on Laryngology, Otology and Rhinology at the Seventy-Ninth Annual Session of the American Medical Association, Minneapolis, June 14, 1928.

1. Fowler, E. P., and Fletcher, Harvey: Three Million Deafened School Children, J. A. M. A. 87: 1877 (Dec. 4) 1926.

Of the twenty-two children whom the 4-A audiometer indicated as deafened in 1926, but who passed within the limit set (9 sensation units loss) as in 1927, ten had audiograms which showed that their hearing had definitely improved during the year. Questioning the children in this class disclosed that only one of them had received medical treatment during the year. In figure 2 are shown the audiograms of two typical cases in this class. The diagnosis of nerve deafness following fracture of the skull was not necessarily correct. Even if it were true, it would seem as though there could have been some improvement. Ten others had audiograms which showed that the hearing was only slightly below normal in either ear and none had changed during the year. These are borderline cases which may on successive tests go on either side of the limits set (namely, 9 sensation units).

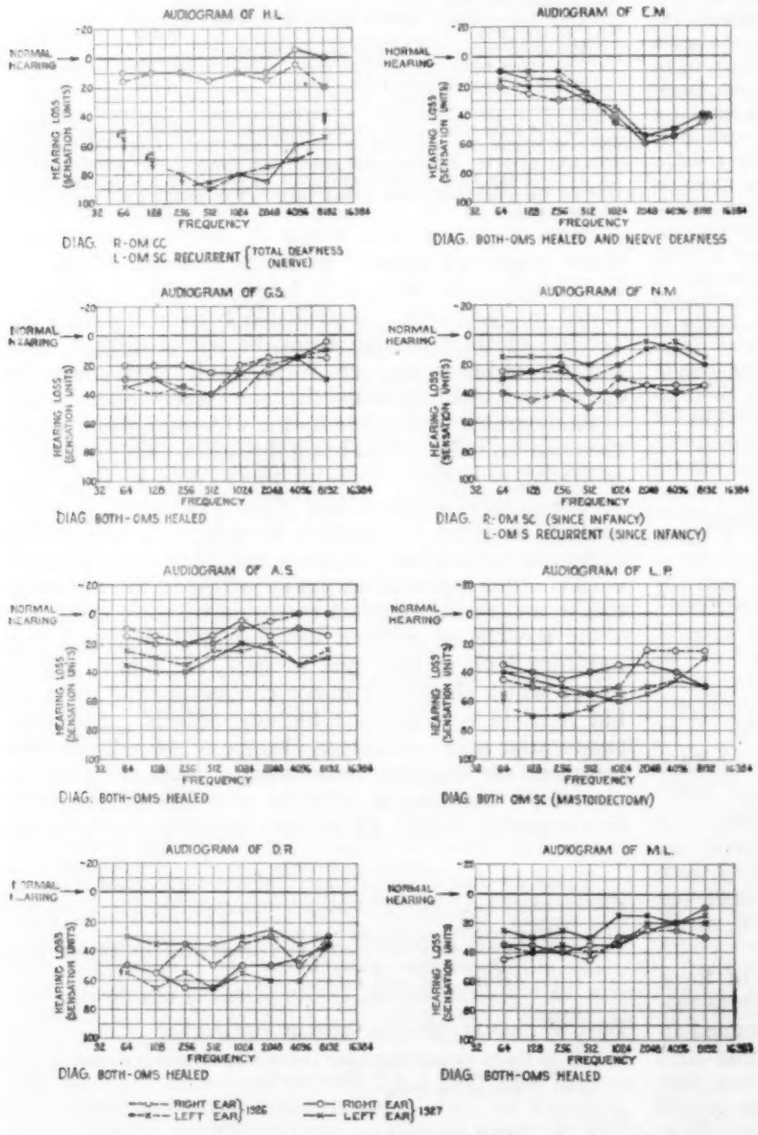

Fig. 1.—Audiograms of eight children with definite hearing defects.

The audiograms of the remaining cases (two out of twenty-two cases) are shown in figure 3. They indicate that no change has taken place during the year but show a definite hearing defect which should have been detected by the 4-A audiometer in 1927 also. It is hard to see how a child having so much loss as indicated by the 2-A audiometer at both of these tests, one year apart, could have succeeded in hearing and interpreting correctly enough numbers to pass the 4-A audiometer test at the 1927 testing. This performance was considered so extraordinary that the two children were tested a third time, but they passed the 4-A audiometer test as before. For interpreting the numbers, these children probably used to good advantage the high range frequencies which are, as shown, quite near the normal.

There were seven children who were passed in 1926 but were caught in 1927 by the 4-A audiometer in whom the audiograms showed that the hearing was only slightly below normal. These cases also can therefore be considered as borderline cases.

There were five children who were passed in 1926 but were caught in 1927 whose audiograms showed a definite hearing loss. No doubt their trouble had started or increased perceptibly during the year. Three were diagnosed otitis media suppurativa healed and two otitis media catarrhalis chronica.

There were in all twenty-two children not in attendance at this school and hence not tested in 1926 who are indicated as being deafened by the 4-A audiometer in 1927. All of these twenty-two showed audiograms indicating definite hearing defects, thereby again confirming the 4-A audiometer tests. Some of these twenty-two may be benefited by treatment, but the majority may remain in the permanently deafened class.

There were thirteen new cases (not tested in 1926 but caught by the 4-A audiometer in 1927) which may also be considered as borderline cases, since the audiograms for these cases indicated the hearing to be normal or slightly below normal. All of the deafened children were examined by one of us and a diagnosis was made.

CONCLUSIONS

The results obtained with both the 4-A audiometer and the 2-A audiometer show that about one third of all children selected as being deafened in a survey such as we have conducted are borderline cases. If, instead of 9 sensation units a limit of 6 sensation units should be taken as indicating a definite hearing defect, the percentage of borderline cases, as well as the total number, would materially increase. Otologic examinations show that there are large numbers in this class (between 6 and 9 sensation units) who need attention and who would derive great benefit from proper treatment. It is probable that if periodic tests were made throughout the year the children in this class would fluctuate between the normal and the deafened class as a result of the observational error involved in making the tests, and also because the children's hearing may be increased or decreased because of colds or other causes.

There is a considerable group which will show a definite improvement during the year without any definite medical or surgical attention. This being so, it would appear to be gross negligence not to aid nature's efforts to cure. When the program that was recommended in our former paper is put into practice,

it is expected that a great number of borderline cases will be found.

There is a large group of children who will show a definite decrease in their hearing ability from year to year. This class must surely be given special medical attention.

It is often very difficult or impossible otologically to distinguish between those cases which are only temporary and which therefore might be expected to improve, and those which are of more permanence or of a deeper seated origin, and hence tending to further hearing losses. The only logical method to overcome the difficulty is to conduct careful annual examinations of the hearing ability and to give special attention not only to those children who fall into the deafened class, but also to those who have shown any signs of ear trouble at any time. It is felt that, by watching a large group of children throughout a number of years and keeping accurate records, very valuable information will be obtained regarding the proper methods of conducting otologic examinations and managing and treating deafened children; and, more than this, data on the etiology of progressive deafness.

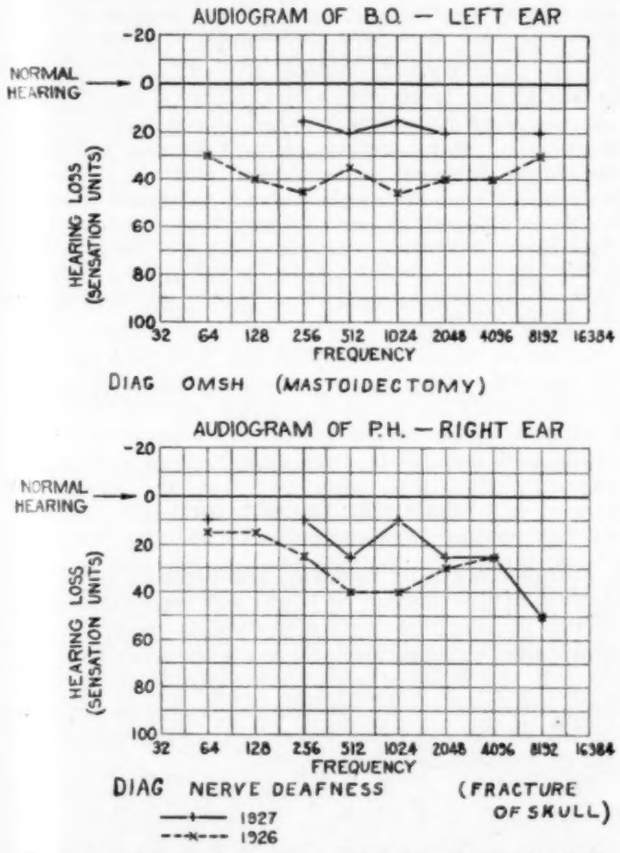

Fig. 2.—Audiograms of two of the children whose hearing improved.

114 East Fifty-Fourth Street—463 West Street.

ABSTRACT OF DISCUSSION

DR. H. B. LEMERE, Omaha: The care of the deaf child in the Omaha schools resolves itself into three phases: (1) the determination of deafness; (2) medical care, and (3) instruction in speech and lip reading. The determination of deafness comes from the observation of the teachers, of the school nurses and of the speech instructors. Our experience with the 4-A audiometer in determining deafness is limited to its trial in one school. In this trial test it fully vindicated its usefulness and practicability, and we all felt that in estimating the hearing of numbers of children it was indispensable. We have, however, so far failed in our efforts to have it adopted in our public schools. Much is being done by our school nurses in advising the parents of those in whom deafness has been determined to seek medical aid. Instruction in speech correction and in lip reading has developed into a department consisting of a supervisor and eight assistants. The pupils are not segregated but are given instructions in their district schools and are enabled as far as possible to carry on their work in the regular classes. In addition to the speech correction work during the first semester, thirty-four very hard-of-hearing children were given instruction in lip reading, voice inflection, and speech. The use of the more exact testing should be for the detection of those cases in which there is a moderate diminution in hearing, which are usually the ones in which the process can be remedied or retarded. These are the cases in which the 4-A audiometer is indispensable. The audiogram recorded in sensation units on the cards provided with the 2-A audiometer gives a somewhat unsatisfactory picture of the functional loss of hearing for air conduction. A record made in percentage loss gives a clearer idea of the proportionate loss for each note as related to the whole range of hearing. I have a chart in which the readings of the audiometer can be recorded at once in percentage terms almost as quickly as they are now in sensation units. The 2-A audiometer charts which the authors showed seem to run counter to our idea of the functional test of hearing. The loss in the lower tone limit on which we have learned to rely in forming a diagnosis is not graphically shown unless percentage loss of hearing is shown.

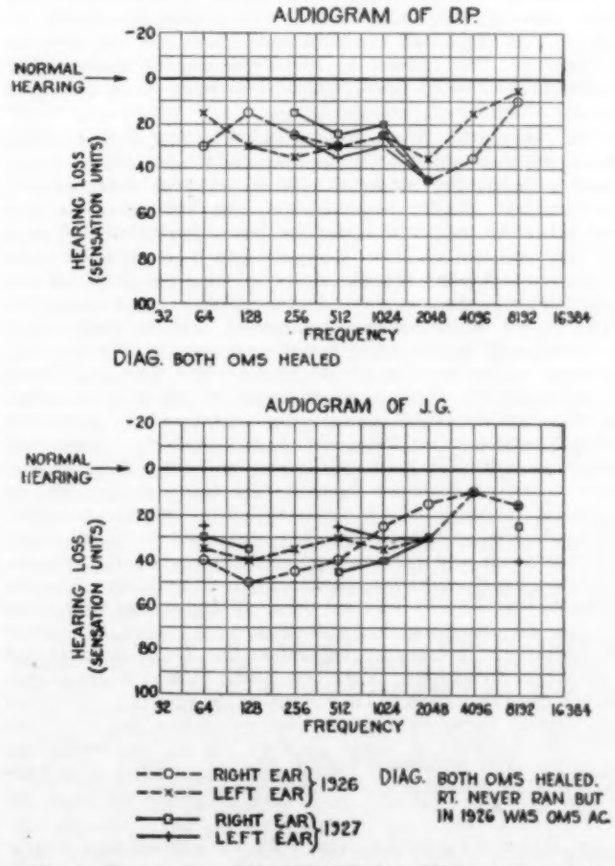

Fig. 3.—Audiograms of two children with definite hearing defects, but who, nevertheless, repeatedly passed the 4-A audiometric test.

DR. HORACE NEWHART, Minneapolis: We have conducted extensive audiometric hearing tests in Minneapolis during the past three years. During each of the last two years between twenty and thirty thousand children have been tested. All those showing on the first test a loss of 6 or more sensation units have been retested. We have arbitrarily chosen as

the limit between those who might be considered normal and those requiring an otologic examination a 6 sensation unit loss. Of these, we regard as borderline those who present in many instances sufficient disease to justify the belief that they may be potentially deaf, and who in all fairness should be given a careful otologic examination. The difference between a loss of 6 and 9 sensation units very probably represents the difference caused by disturbing noises occurring in a relatively quiet community like Minneapolis, and in New York, where Drs. Fowler and Fletcher conducted their work. To the list of questions asked each child on the original blanks as recommended by Drs. Fowler and Fletcher we have added these: Have you had your tonsils or adenoids removed? Is any member of your family hard of hearing? Have you had a mastoid operation? Our observations do not differ materially from those of the authors of this paper. As the result of our studies we are convinced of the great value and importance of the periodic audiometric testing of the acuity of hearing of all school children, and of the advantage of establishing in all of our larger cities a diagnostic ear clinic in the public schools for the purpose of insuring to all children found to have defective hearing an adequate otologic examination. The audiometer survey, though most important, is only the initial step in the procedure. Success in the prevention of deafness depends on the otologic follow-up, and the treatment of cases in which medical care is indicated. Many cities have recently fallen into line and officially adopted the plan. The organized deafened throughout the country are insistent in their appeals to secure the annual testing of all children, recognizing that it provides in many cases the surest safeguard against deafness.

Dr. Harold M. Hays, New York: The fact that there are three million deafened children in the United States represents an appalling condition. When we read a report of a few hundred children examined by the audiometer it does not appeal to us particularly, but when one thinks of three million deafened children it means that there is work to be done in the United States. A lot of men are skeptical and say, "What is the use of the doctor trying to treat these children if they improve without treatment?" In the clinic which we conducted in our office for three years, and in the continuance of that work in the Manhattan Eye, Ear and Throat Hospital by Dr. Fowler, we have found that a great many of these children are permanently improved and some are actually cured when they are treated properly. The fault has been with us in the past. If children, aged 15 or 18, who have recurrent deafness three or four times a year, and in whom it is impossible to keep the nose and throat clean, although between attacks the hearing seems to be all right, are not given any care one can readily realize the result—many deafened adults for whom we can do nothing. It seems a shame that we will not treat these children at the time when we can do something, but still treat adults when we cannot do anything. It takes an enthusiast like Dr. Fowler to put over work of this kind. Very few young otologists are enthusiastic over this work. They want to do mastoid operations and various forms of surgery. But we realize that if we can cure the deafness of these children we are accomplishing much for their later life. I think that our problem is to educate the young otologist to prevent deafness as much as possible.

Dr. Harvey Fletcher, New York: We should keep clearly in mind the scientific facts presented and the observations reported in this paper. There are a certain number of patients who will oscillate back and forth in the deafened class whether one does anything for them or not; there will be a certain number who will oscillate simply because of observational error in testing; there will be a class who will come back to normal without having anything done for them, and there will be still another class of hard of hearing who can be cured and who would remain permanently deafened unless some medical attention was given. If only one third or even one tenth of this class is treated, it can be seen how many people will be saved from deafness in the United States. That is the point we wanted to bring out in our paper. Dr. Lemere's question about the sensation units is one that has been occupying the attention of a number of people who have been working on this for a long time. Dr. Fowler and others of us who have studied the question carefully feel quite sure that the best unit to use in research work is the sensation unit. The percentage hearing unit was abandoned because it is different for every sound. It is different for speech, different for different tones, and different when one uses the tuning folk. The sensation unit is best. That is why the change was made. When one gets used to it, it will not make any difference as far as convenience is concerned, but it will make a difference in being more uniform. Moreover, the sensation unit is more definitely related to the loss of function of the nerve—one can find the mechanical loss at all frequencies. Percentage hearing does not give that. We have been studying the question that Dr. Newhart brought up in regard to 6 sensation units being the proper limit to use instead of 9, and agree with him that that is the best limit that we can recommend in using the audiometer for differentiating between the deafened class and the normal. Our investigations have shown that even though the hearing is normal in one ear, the child has considerably more difficulty in understanding what is being said than when he has two normal ears, and we have shown that there is a much larger number of repeaters—those who have to repeat a grade in order to pass the examinations—among those who have lost the hearing in one ear, than among those who have two normal ears.

MALPOSITION OF THE STOMACH AND BOWEL

THEIR MEDICAL AND SURGICAL SIGNIFICANCE *

SAMUEL BROWN, M.D.
CINCINNATI

Before the era of radiology the presence of a malposition of the stomach or bowel was recognized either during an operation on the abdominal cavity or at a postmortem examination. Since the introduction of the x-ray in the examination of the gastro-intestinal tract the existence of any malposition can readily be shown in the life of the individual under ordinary circumstances and its importance fully evaluated.

Malpositions of the stomach and bowels may be divided into two classes: the congenital and the acquired. The congenital malpositions are found less frequently than the acquired forms. Their significance is chiefly that of a medical curiosity. However, should an abdominal operation be undertaken for any cause, a knowledge of their presence may prove to be of surgical value. The acquired malpositions are of more importance. Their presence indicates some pathologic process in the abdominal viscera which will require surgical attention.

In the study of malpositions of the stomach and bowels the radiologist must be careful in the differentiation between normal variations in the position of the gastro-intestinal tract and actual malpositions. A knowledge of the following characteristics possessed by the hollow viscera will assist one in avoiding wrong conclusions:

1. The stomach and bowels, though they have fixed points, possess a certain degree of freedom of movement in the abdominal cavity. Thus their position will depend to a large extent on the position of the body as a whole.

2. The stomach and bowels are elastic organs and therefore their volumes will depend on their contents. The size of the volume will often determine their position in the abdominal cavity.

* Read before the Section on Radiology at the Seventy-Ninth Annual Session of the American Medical Association, Minneapolis, June 15, 1928.

3. The stomach and bowels are contractile organs. Thus the muscular tone may affect the shape and often even the position of these organs.

4. The most important characteristic of the stomach and bowels is the relation which they bear to the habitus of the individual. It is practically a truism that the shape, size and position of the abdominal viscera vary with the habitus of the individual. It must constantly be borne in mind that the normal position for one particular habitus may be entirely abnormal for a different type of habitus. It is thus evident that before any conclusions are drawn as regards the position of the abdominal viscera the special characteristics of the stomach and bowels as well as the particular habitus of the individual should be taken into consideration.

Having decided that the position of the stomach or bowels of a certain individual is abnormal, one should determine whether it is of a congenital or an acquired origin. As a rule, the differentiation between congenital and acquired malpositions is not difficult. Occasionally it may be hard to determine the exact origin. The finding of more than one anomalous position of the hollow viscera is suggestive of a congenital origin. If it is decided that the malposition is of an acquired origin, it is then necessary to determine whether the abnormal position is due to a lesion associated with the gastro-intestinal tract such as adhesions, or whether it is due to a lesion of the other abdominal viscera such as tumors. In order to make such a differentiation possible it is essential to understand the normal anatomic position of the abdominal organs and the relation they bear to one another as demonstrated in the roentgenograms. The three dimensional study of the abdominal organs, that is, the use of the anteroposterior and lateral views of the abdominal organs, has shown that an alteration in the shape, size and position of one organ will produce a change in the shape or position in the neighboring organ or organs. This study led to the following deductions:

1. A deviation of the stomach and duodenum to the left and backward is due to a large liver.

2. A deviation of the stomach and duodenum to the left and forward is due to a tumor of the right kidney.

3. A deviation of the stomach and duodenum to the right and forward is due either to a large spleen or to a tumor of the left kidney. In the case of the spleen, the splenic flexure is displaced downward. In case of a kidney tumor, the splenic flexure remains in normal position.

4. When the stomach and duodenum are in normal position in the anterior aspect but displaced forward in the lateral aspect, it is usually due to a tumor of the pancreas or a retroperitoneal tumor. If any side to side displacement takes place, the stomach and duodenum are deviated in opposite directions; that is, the stomach is displaced to the left and the duodenum is displaced to the right. Downward displacement of the duodenojejunal portion of the small bowel is due to a tumor of the body of the pancreas.

5. Backward displacement of the cecum and ascending colon is generally due to an intra-abdominal tumor or to fluid in the peritoneal cavity. Forward displacement of the cecum and ascending colon may be due to a tumor of the right kidney or to a retroperitoneal tumor. Downward displacement of the hepatic flexure may be due either to a large liver or to a large kidney tumor. Downward displacement of the splenic flexure is due to a tumor of the spleen. Lateral displacement of the descending colon is due to a tumor of the left kidney or to a retroperitoneal tumor. Upward displacement of the sigmoid and pelvic colon is generally due to pelvic tumors.

CONCLUSION

The radiologic method enables one to discover any malposition of the stomach and bowel under ordinary conditions. Both the congenital and the acquired malpositions are of surgical importance in case an operation is undertaken for any cause. A study of the acquired malpositions in three dimensions makes it possible in an indirect way to recognize lesions outside the gastro-intestinal tract.

705 Pearl Market Bank Building.

Clinical Notes, Suggestions and New Instruments

A CASE OF MAGNESIUM SULPHATE POISONING *

HARVEY S. THATCHER, M.D., LITTLE ROCK, ARK.

Death from magnesium sulphate poisoning is rarely reported. It is a recognized fact that magnesium sulphate in large doses is toxic, but few cases of death from this drug with autopsy reports have been recorded.

L. M. S., an American farmer, aged 26, poorly nourished, single, entered the State Hospital for Nervous Diseases, Jan. 11, 1927, with a provisional diagnosis of psychoneurosis of the neurasthenic type. At 6 a. m., January 12, he was given a dose of magnesium sulphate. A solution of the salt had been placed accidentally in the same ward near the patient. The preparation had disappeared and evidently had been taken by him. He was found dead at 7:10 a. m.

The principal gross pathologic changes were the presence of approximately 1 liter of yellowish brown fluid in the stomach, and a dark red and hemorrhagic appearance of the lining of the stomach. There were recent hemorrhages throughout the small intestine, and considerable blood was mixed with the contents. The hemorrhages averaged 5 mm. in their largest dimension. There were a few hemorrhages in the region of the cecum. There was marked congestion of the lungs, trachea and main bronchi, and of the heart, liver and kidneys. There was also acute splenic hyperplasia.

The principal microscopic pathologic changes were small hemorrhages on the mucosa of the stomach and the intestine. The lungs were markedly congested. The vessels of the heart, kidneys, spleen, liver, stomach, intestine and suprarenals were engorged with blood.

The chemist reported 883½ grains (57 Gm.) of magnesium sulphate in the contents of the stomach. As the dosage is 240 grains (15.5 Gm.), the amount recovered was more than three times the required dose.

Boos [1] collected reports of ten cases of magnesium poisoning in 1911. In only three of these had autopsy been performed. The main postmortem and operative observations were "patches of reddening on the mucosa of the stomach with free fluid in the abdominal and pleural cavities." Since that date Prestley [2] and Anderson [3] have reported two cases each of similar poisoning with recovery. There must have been an idiosyncrasy to the drug in the first patient reported by Prestley. The dosage is not given for his second patient. The dosage was entirely too large for Anderson's patients. Kerr [4] reported two cases of tetanus in children resulting from subcutaneous injections of magnesium sulphate because of the depression of the muscular

* From the Department of Pathology, University of Arkansas School of Medicine.

1. Boos, W. F.: Magnesium Poisoning: A Study of Ten Cases, J. A. M. A. **55**: 2037-2042 (Dec. 10) 1910.

2. Prestley, J. P.: Toxic Effects of Magnesium Sulphate, New York M. J. **96**: 665 (Sept. 28) 1912.

3. Anderson, W. W.: Magnesium Sulphate Poisoning in Children, J. M. A. Georgia **10**: 826-830 (Dec.) 1921.

4. Kerr, LeGrand: Case Reports: Two Experiences with the Subcutaneous Injection of Sulphate of Magnesium in Tetanus in Children, Long Island M. J. **8**: 90-92 (March) 1914.

and nervous functions. Respiratory paralysis and death occurred. The dosage must have been too large.

The case reported here illustrates that more care should be exercised in the administration of magnesium sulphate. Toxicity may result without death. An idiosyncrasy may exist and the average dose may be toxic.

If toxicity does occur after its use, the treatment consists of the subcutaneous or intravenous administration of calcium salts, according to Meltzer and Auer.[5] There is an antagonistic action of calcium on the inhibitory effect of magnesium.

A DEVICE FOR FACILITATING THE USE OF FINE GAGE LUMBAR PUNCTURE NEEDLES

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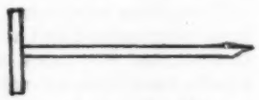
Anesthetist, Lahey Clinic

In making lumbar punctures for spinal anesthesia it is desirable to use as fine a needle as possible in order to lessen the incidence of postoperative headache. The fine needles, however, are quite flexible. This makes it difficult, in traversing resistant tissue such as the posterior spinous ligament, to retain the direction of the needle. If the conical point of Greene is used it is sometimes almost impossible to puncture the skin. In order to overcome these difficulties I have devised a small cannula, the lumen of which just fits the spinal needle to be used. This cannula has a sharp cutting point and a somewhat wide flange at the base, and is 1¼ inches long. It is used by being inserted through the skin and posterior spinous ligament much like a thumb-tack. Thus it acts as a guide and path for the slender spinal needle, which will then traverse the remaining distance very easily. The cannula is not inserted to its full length so that, if the original direction is not quite correct, the needle may be partly withdrawn and, by pushing one way or another on the base of the cannula, the needle can be redirected in any way that is desired. I feel that by the use of this simple device with a fine spinal needle, the good points of both the large needle and the fine needle are retained, while most of the bad points are eliminated.



The cannula, actual size.

605 Commonwealth Avenue.

A DEATH IN CHICAGO IN SEPTEMBER, 1928, FROM INFLUENZA*

EDWIN F. HIRSCH, M.D., AND E. R. LECOUNT, M.D., CHICAGO

The interpandemic life cycle of a disease of unestablished etiology such as influenza is not well understood, but it is reasonable to think that between distinct pandemics the disease virus is transmitted from host to host, manifesting itself only in a mild form or in endemic sporadic attacks which repeat in all details the pandemic disease. Jordan,[1] in discussing the occurrence of influenza endemically and epidemically during the interpandemic years, concludes that the pandemic influenza virus does not die out completely between pandemics in the way, for example, that the cholera virus has died out in North America; and in any given case certain identification is, at present, impossible.

This statement no doubt holds true in an analysis of the statistics of the years 1890 to 1918, for it seems that in many reports between these pandemics influenza was diagnosed clinically, but the reliability of such diagnoses nowhere approaches in certainty the isolation of a causal agent, such as the typhoid bacillus from the blood stream or excretions of a patient with typhoid. With influenza, however, although the causal agent has not been established, it is known, as the result of postmortem observations of the disease during the pandemic of 1918, that the lungs of patients dying of this disease possess certain characteristic changes[2] by which the disease may be recognized with considerable accuracy. Among these are the increased weight of the lungs resulting from extravasated blood, exudate and edema; the circumscribed, purple, elevated regions of lung tissue likened to "buttons," with a thin fibrinous exudate on the pleura; the thin flocculent exudate in the bronchi and bronchioles sometimes forming a hyaline membrane; the widespread hemorrhages; and, in microscopic preparations, the thin layer of fibrin close to the lining of the alveoli and the alveolar ducts.

In lieu, then, of isolating the causal agent and making the identification certain in this way, recourse is had to establishing by postmortem and histologic examinations these characteristic changes of the lungs.

It has been a number of years since the influenza pandemic of 1918 and the minor epidemics of 1919 and 1920 swept Chicago. As evidence that the disease has not disappeared altogether from this locality, the following brief report is offered:

REPORT OF CASE

G. P., aged 49, a salesman, was admitted to the service of Dr. Gilbert in St. Luke's Hospital, Aug. 24, 1928, because of nephritis. The blood pressure was 176 mm. of mercury systolic and 110 diastolic. Edema of the extremities and face had disappeared almost completely by August 31. The urine contained from 30 to 50 mg. of albumin per hundred cubic centimeters and occasionally casts. The urea nitrogen of the blood on August 25 was 28.5 mg.; the total nonprotein nitrogen, 47.2 mg.; the uric acid, 4.4 mg., and the carbon dioxide combining power 61.7 per cent by volume. September 8, the patient expectorated considerable bloody fluid, especially while coughing, and some dulness of the left apex was noted with increased bronchial breathing. A slight swelling of the feet and ankles occurred, and on September 9 he became very weak, cyanotic and dyspneic. The temperature, which had been nearly normal for several days, rose to 102.4 F.; the pulse rate to 124, and the respirations to 24. Death occurred at 12:45 a. m., September 11.

Postmortem examination, September 11, at 9:45 a. m., disclosed huge bilateral confluent (influenzal) pneumonia of the lungs; slight bilateral serofibrinous pleuritis; marked acute catarrhal bronchitis and tracheitis; subacute diffuse nephritis, with large white kidneys; fatty changes of the liver, kidneys and heart; acute hyperplasia of the spleen and parabronchial lymph glands, and cloudy swelling of the liver, kidneys and myocardium.

The right lung weighed 1,950 Gm.; the left, 1,700 Gm. The outside of the right lung was mottled with many single and confluent slightly raised, dark purple regions, several centimeters in diameter, corresponding in outline to one or more lung lobules. The pleura covering these, when examined in direct sunlight, was covered by a thin layer of fibrin. Most of the posterior portions and almost all of the lower lobe were changed in this way, and only along the anterior margin of all the lobes was there crepitant tissue. Surfaces made by cutting the solid portions of the lungs were dark red, slightly raised and granular. The lining of the bronchi and the bronchioles was dark red and on the surface of the mucosa were small flocculi of a yellow exudate, some of them with faint greenish cast. What seemed to be dark red, airless tissue could, in fact, be inflated and became thereby somewhat crepitant. The condition of the left lung was essentially like that of the right, and, for brevity, other alterations of the lungs not relevant are omitted. Pieces from many parts of both lungs were examined in microscopic preparations stained with hematoxylin and eosin, and with phosphotungstic acid hematoxylin. The solid red places had alveoli filled with masses of red blood cells, a few fibrin threads, and, in certain places, small aggregates of polymorphonuclear leukocytes. In less solid portions there was a narrow layer of fibrin forming in many alveoli an almost continuous lining sheet about 6 to 12 microns wide. No growths were obtained from the pericardial fluid or blood in the heart. From the lungs, tracheobronchial lymph

5. Meltzer, S. J., and Auer, J.: The Antagonistic Action of Calcium upon the Inhibitory Effect of Magnesium, Am. J. Physiol. **21**: 400-419 (May 1) 1908.

* From the Henry Baird Favill Laboratory of St. Luke's Hospital.

1. Jordan, E. O.: Epidemic Influenza, Chicago, American Medical Association, 1927, p. 60.

2. LeCount, E. R.: The Pathologic Anatomy of Influenzal Bronchopneumonia, J. A. M. A. **72**: 650 (March 1) 1919; Disseminated Necrosis of the Pulmonary Capillaries in Influenzal Pneumonia, ibid. **72**: 1519 (May 24) 1919.

glands and spleen, streptococci, staphylococci and *B. coli* were isolated. In smears from the spleen, a few fine gram-negative bacilli were found.

COMMENT

Possibly this is a sporadic manifestation of influenza in its endemic form or perhaps it is a forerunner of a serious outbreak, just as the pandemic in the fall of 1918 was preceded as early as April[3] of that year by inflammations of the lungs which later were identified as influenzal. The distribution of the disseminated pneumonia, the great increase in the weight of the lungs, the characteristic purple, sharply limited "buttons" of subpleural hemorrhage, the even thin hyaline deposit on the lining of the smaller air passages and death on the second day all conform to the characteristic manifestations of the disease with which we became so familiar in 1918.

NEEDLE-PULLING FORCEPS

WILDER PENFIELD, M.D., MONTREAL

The operative maneuver which occupies more of a surgeon's time than any other is concerned with passing a needle through tissue and tying the suture. The simple needle-pulling forceps described here I have used as a routine for the past five years at the Presbyterian Hospital, New York. They enable the operator to pull the suture needle out of the tissue quickly and easily with the same thumb forceps that he uses to manipulate the incision edges. This keeps the fingers out of the wound and carries out this oft repeated maneuver faster and more simply than is possible when an assistant pulls the needle through.

Needle-pulling forceps, attached to operator's thumb forceps, and in positions for holding needle.

The device consists of a saddle-shaped piece of metal which may be attached to the operator's favorite thumb forceps,[1] as shown in the accompanying illustration. It in no way hampers the use of the forceps for tissue, as the blade ends may be approximated just as usual. After the surgeon has thrust a needle of any description through the tissue with the right hand, he is ready without change of instrument to seize the emerging end of the needle with the tissue forceps in his left hand. He may catch the needle either between the teeth of the saddle and the opposite blade or between the blades of the forceps just distal to the saddle, as shown in the diagram.

In either case the needle may be pulled through and returned to the nurse with a single movement. The operator's thumb should be on the blade that carries the saddle.

No apology is made for the simplicity of this device. On the contrary, surgical technic in America is somewhat in need of simplification. We are apt to be confused by the number of willing hands that surround us at the operating table and to let others carry out manual procedures better executed by ourselves.

Royal Victoria Hospital.

3. Le Count, E. R., in discussion on Longcope, W. T.: Survey of the Epidemic of Influenza in the American Expeditionary Forces, J. A. M. A. **73**: 189 (July 19) 1919.

1. The forceps have been made by Tiemann, 107 East Twenty-Eighth Street, New York.

Interstitial Hernia.—This may be defined as any hernia which in the course of its development spreads out in the planes or interstices of the abdominal wall. It was first described by Bartholin in 1661; then by Petit in 1797, by Küster in 1880, and by Krönlein in 1876. Since then many cases of anomalous inguinal hernias have been reported and the various types fully described.—Beigler, S. K., and O'Brien, Harold: Interstitial Hernia, *Wisconsin M. J.*, September, 1928.

Special Article

COMMERCIAL ACIDOPHILUS PRODUCTS*

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PETER COHEN, B.S.
AND
PHILIP BEERMAN, B.S.
WARD'S ISLAND, N. Y.

The therapeutic value of *Bacillus acidophilus* is well established.[1] But there remains considerable doubt as to the relative merits of the various commercial acidophilus products now on the market. There are instances in which no information is given on the label or even in the literature distributed by the manufacturer, as to the number of viable *Bacillus acidophilus* which the commercial acidophilus product contains. How, therefore, can the physician make a recommendation to his patient? Further, when statements concerning a product are made, how is the physician to determine their authenticity? The present investigation concerned with laboratory analyses alone, is intended to throw some light on a number of commercial acidophilus products which might be expected to be of therapeutic value. It is important to state at the outset that all products were purchased anonymously in the open market.

PROCEDURE

Within twenty-four hours after the samples reached the laboratory they were analyzed (with two exceptions). The following data, if accessible, were recorded: name, date received, date of examination, date of manufacture, date of expiration, number of acidophilus bacilli guaranteed, character of vehicle, color, taste, consistency, acidity (titrated with tenth-normal sodium hydroxide) and Gram stain (Kopeloff and Beerman modification[1]).

The determination of the number of viable acidophilus bacilli was made by plating all milk samples on the same batch of whey agar[2] and casein digest agar.[3] Aqueous suspensions were plated on meat infusion (instead of whey) agar and casein digest agar. The concentration of agar in all mediums was 1.2 per cent and the p_H from 6.8 to 7.0. One per cent lactose was always added.[4] The plates were incubated at 37 C. for three days as ordinarily and a parallel series was incubated in the presence of 5 to 10 per cent carbon dioxide gas.[5]

Before plating, the following dilutions were made: Ten cubic centimeters of the original sample was added to 90 cc. of physiologic sodium chloride solution, making a dilution of 1:10. Subsequent dilutions of 1:1,000, 1:100,000 and 1:1,000,000 were made. One cubic centimeter of dilutions 1:10 and 1:1,000 were plated in quadruplicate, while dilutions of 1:100,000 and 1:1,000,000 were plated in sextuplicate. Then one half the plates were incubated atmospherically at 37 C. and the other half in from 5 to 10 per cent of carbon

* From the Department of Bacteriology, Psychiatric Institute.
* The expenses of this investigation have been defrayed by the American Medical Association.

1. Kopeloff, Nicholas: Lactobacillus Acidophilus, Baltimore, Williams & Wilkins Company, 1926.
2. Rettger, A. F., and Cheplin, H. A.: Transformation of Intestinal Flora, Yale University Press, 1921.
3. Kulp, W. L., and Rettger, L. F.: A Comparative Study of Lactobacillus Acidophilus (Moro) and Lactobacillus Bulgaricus (Massol), J. Bact. **9**: 357-396 (July) 1924.
4. Difco peptone and sugars, Liebig's meat extract, Eimer and Amend's c. p. casein and Fairchild Brothers and Foster's trypsin were employed.
5. Kulp, W. L.: The Determination of Viable Lactobacillus Acidophilus, Science **64**: 304-306, 1926.

dioxide. A preliminary examination of atmospherically incubated plates was made at the end of twenty-four hours to determine the number of contaminants present. Control plates were always included. At the end of three days' incubation, all plates were counted with a magnifying lens and the numbers of acidophilus bacilli and contaminants appearing on the plates from the two highest dilutions were recorded.

TABLE 1.—*A*

	First	Contaminants	Second	Contaminants	Aver. B. acidophilus	Aver. Contaminants
Date received	9/15		9/26			
Date examined	9/17		9.28			
Date manufactured	9/12		9/23			
Date of expiration	12/ 7		12/14			
Vehicle	Broth					
Color	Straw					
Taste	Sour					
Consistency	Watery					
Cubic centimeters of tenth-normal sodium hydroxide per 1 cc	1.40		1.05		1.23	
Gram stain	— and + rods		+ rods			
Type of colony	X		X			
B. acidophilus† on casein digest agar in air	23	0	1	1	12	1
B. acidophilus on casein digest agar in 10% carbon dioxide	13	3	S	S	13	3
B. acidophilus meat infusion agar in air	0	0	0	0	0	0
B. acidophilus meat infusion agar in 10% carbon dioxide	S	S	40	4	40	4
B. acidophilus average in air	12	0	1	6	7	3
B. acidophilus average in carbon dioxide	13	3	40	4	22	3
Dextrose	+		+		+	
Maltose	—		—		—	
Levulose	—		—		—	
Sucrose	—		—		—	
Critical surface tension (in dynes)						
Ricinoleate	43.0		43.0		43.0	
Oleate	48.0		48.0		48.0	

* In the tables, S indicates spreaders; +, fermentation; sl., slightly; v., very; —, no fermentation.

† The numbers of acidophilus bacilli are millions per cubic centimeter.

The type of *B. acidophilus* present on the plates was noted. The X type is the familiar irregular woolly colony, while the Y type is a smooth-edged, oval, dense colony. The X type is of proved therapeutic value; the Y type is still under consideration.

From the plates of each sample three colonies were fished and planted in three flasks of sterile milk containing bromcresol purple as an indicator. All samples coagulated milk with a production of acid on incubation. The purity of these cultures was checked by the Gram stain. Pure cultures were used to inoculate triplicate tubes of sugar-free casein digest broth p_H 7.0 to which 1 per cent of dextrose, maltose, sucrose and levulose were added, together with 0.5 cc. of a 5 per cent alcoholic solution of bromcresol purple. Dextrose, maltose and sucrose solutions were sterilized in the autoclave, while levulose was filtered through a Mandler diatomaceous filter. Control tubes and tubes inoculated with pure stock cultures of *B. acidophilus* and *B. bulgaricus* were incubated with these substances at 37 C. for one week and fermentation recorded. *B. acidophilus* fermented all the sugars, but *B. bulgaricus* fermented only dextrose. The test was repeated if there was any disagreement in triplicate determinations.

The same cultures used for the fermentation tests were acclimatized by three transfers to yeast medium for surface tension tests, 4.2 per cent sodium ricinoleate and 26.4 per cent sodium oleate being used. Control tubes were kept in the icebox and *B. acidophilus* and *B. bulgaricus* pure stock cultures were incubated with the other cultures at 37 C. for one week. At the end of this time the readings were made and the results calculated in dynes as previously described by us.[6]

RESULTS

Uniformity of product is a difficult achievement with *B. acidophilus*. Consequently, two samples of each commercial product were analyzed and, unless there was agreement, further analyses were performed until consistent results were established. The following detailed analyses are presented in alphabetical order.

A.—This product was purchased directly from the manufacturer. It purports to contain *B. acidophilus*. The label bears a production and expiration date but no statement as to the number of viable organisms.

It may be seen in table 1 from the results of two analyses of this product that the average acidity is 1.23 per cent, which conforms to specifications. But it will be evident at once from an examination of the sugar fermentations and the surface tension test that the culture does not contain *B. acidophilus* according to present laboratory criteria. The predominating organism ferments dextrose but fails to ferment maltose, levulose and sucrose. It does not grow at a surface tension below 43 dynes. From these data it is therefore identical with *B. bulgaricus* rather than *B. acidophilus*. The number of viable organisms per cubic centimeter does not exceed 40 million. It must be concluded, however, that this product cannot rightfully be classed as one containing *Bacillus acidophilus*.

TABLE 2.—*B*

	First	Contaminants	Second	Contaminants	Aver. B. acidophilus	Aver. Contaminants
Date received	9/10		9/27			
Date examined	9/17		9/28			
Date manufactured	—		—			
Date of expiration	10/26		11/ 7			
B. acidophilus per cubic centimeter guaranteed	50					
Vehicle	Milk					
Color	White					
Taste	Sour					
Consistency	Thick					
Cubic centimeters of tenth-normal sodium hydroxide per cc	1.05		1.10		1.08	
Gram stain	+ v. short		+ rods			
Type of colony	Y		Y			
B. acidophilus on casein digest agar in air	260	0	280	20	270	10
B. acidophilus on casein digest agar in 10% carbon dioxide	20	0	S	S	20	0
B. acidophilus on whey agar in air	245	1	410	0	328	1
B. acidophilus on whey agar in carbon dioxide	S	S	900	0	900	
B. acidophilus average in air	253	1	345	10	298	6
B. acidophilus average in carbon dioxide	26	0	900	0	463	0
Dextrose	+		+		+	
Maltose	+		+		+	
Levulose	+		+		+	
Sucrose	—		—		—	
Critical surface tension (in dynes)						
Ricinoleate	36.5		36.5		36.5	
Oleate	35.0		35.0		35.0	

B.—This product was also purchased directly from its manufacturers in New York City. The label bears a date of expiration but none of manufacture. It is claimed that this acidophilus milk contains 50,000,000 viable *B. acidophilus* per cubic centimeter.

The significant feature of the data presented in table 2 is that we are here dealing with a Y type of

6. Kopeloff, Nicholas; and Beerman, P.: Surface Tension Studies with L. Acidophilus and L. Bulgaricus, Jour. Infect. Dis. **40**: 656-666 (June) 1927.

B. acidophilus which differs from the X type in its fermentative powers. As stated at the outset, the therapeutic value of this type of *B. acidophilus* is yet to be scientifically established. It will be noted that counts of more than 400 millions per cubic centimeter have been recorded. Fermentation of dextrose, maltose and levulose were obtained, as with the pure stock culture of *B. acidophilus*. But the former did not ferment sucrose, while the latter does. Again, there is a very slight difference to be noted in favor of the pure culture of *B. acidophilus*, which grows at 35.0 dynes with sodium ricinoleate, while the predominating organism of the present product cannot grow below 36.5 dynes.

It must be concluded that this product contains *B. acidophilus* but that its therapeutic efficiency requires clinical substantiation.

TABLE 3.—*C*

	First	Contaminants	Second	Contaminants	Third	Contaminants	Average B. acidophilus	Average Contaminants
Date received	9/16		9/28		1/23/28			
Date examined	9/17		9/28		1/23/28			
Date of manufacture	—							
Date of expiration	10/6		10/20					
B. acidophilus per cubic centimeter guaranteed	—							
Vehicle	Milk							
Color	Sl. caramel							
Taste	Flat		Sl. Sour					
Consistency	Thin							
Cubic centimeters of tenth-normal sodium hydroxide per cc	0.65		0.72		0.78			
Gram stain	+ rods		+ rods					
Type of colony	X							
B. acidophilus on casein digest agar in air	6	0.5	3	1	2	4	4	2
B. acidophilus on casein digest agar in 10% carbon dioxide	53	1	S	S	60	0	57	0
B. acidophilus on whey agar in air	5	0.5	S	S			5	0.5
B. acidophilus on whey agar in 10% carbon dioxide	S	S	1	1			1	1
B. acidophilus average in air	6	0.5	2	1	2	4	3	2
B. acidophilus average in carbon dioxide	5	0.5	1	1	60	0	22	1
Dextrose	+		+		+		+	
Maltose	+		+		+		+	
Levulose	+		+		+		+	
Sucrose	+		+		+		+	
Critical surface tension (in dynes)								
Ricinoleate	35.5		35.5				35.5	
Oleate	35.0		35.0				35.0	

C.—This product was purchased at a large soda fountain in New York City which orders a fresh supply daily. It bears a date of expiration but no date of manufacture or statements as to the number of viable organisms.

It will be seen from table 3 that the maximum counts of viable acidophilus bacilli averaged 57 million per cubic centimeter. The fermentation and surface tension tests of the predominating organism agree with those in which a pure stock culture of *B. acidophilus* was employed.

Consequently, it must be concluded that this product contains authentic *B. acidophilus*.

D.—This product was purchased at the same soda fountain as *C*. According to its label it is "a pure culture of *Bacillus acidophilus* containing 250 millions of viable organisms." It bears a date of expiration but none of manufacture.

From table 4 it will be seen that the maximum number of viable organisms has been about one half of that specified. Fermentation and surface tension tests, however, yield satisfactory results.

It must be concluded from five different analyses that this product does not fulfil the expectation engendered by its label.

TABLE 4.—*D*

	First	Contaminants	Second	Contaminants	Third	Contaminants	Fourth	Contaminants	Fifth	Contaminants	Average B. acidophilus	Average Contaminants
Date received	9/16		9/27		10/10		12/17		1/23/28			
Date examined	9/17		9/28		10/11		12/17		1/23/28			
Date manufactured	—											
Date expired	10/23		10/21		11/18				2/23			
B. acidophilus per cubic centimeter guaranteed	250											
Vehicle	Milk											
Color	Sl. caramel											
Taste	Flat											
Consistency	Thin											
Cc. tenth-normal sodium hydroxide per cc	0.65		0.85		0.75		0.75		0.7			
Gram stain	+ rods cocci		+ rods cocci		+ rods		+ rods		+ rods			
Type of colony	X		X		X		X		X			
B. acidophilus on casein digest agar in air	130	1	12	0	18	4	75	1	22	1	51	1
B. acidophilus on casein digest agar in 10% carbon dioxide	60	0	0	0	69	1			8	0	28	0
B. acidophilus on whey agar in air	15	0	2	0	S	S					9	0
B. acidophilus on whey agar in 10% carbon dioxide	120	1	0	0	56	2					59	1
B. acidophilus average in air	73	1	7	0	18	4					33	2
B. acidophilus average in carbon dioxide	90	1	0	0	64	2					38	1
Dextrose	+		+		+						+	
Maltose	+		+		+						+	
Levulose	+		+		+						+	
Sucrose	+		+		+						+	
Critical surface tension (in dynes)												
Ricinoleate	36.0		36.0								36.0	
Oleate	35.0		35.0								35.0	

TABLE 5.—*E*

	First	Contaminants	Second	Contaminants	Third	Contaminants	Average B. acidophilus	Average Contaminants
Date received	9/27		10/21		2/7/28			
Date examined	9/28		10/22		2/7/28			
Date manufactured	—							
Date of expiration	9/31		—		2/18			
B. acidophilus per cubic centimeters guaranteed	500							
Vehicle	Milk							
Color	White							
Taste	v. Sour							
Consistency	Thick							
Cubic centimeters of tenth-normal sodium hydroxide per cc	2.25		2.95		2.00			
Gram stain	+ large rods		+ rods					
Type of colony	X		X					
B. acidophilus on casein digest agar in air	9	3	58	0	180	0	82	1
B. acidophilus on casein digest agar in 10% carbon dioxide	14	0	2	1	0	0	5	0
B. acidophilus on whey agar in air	145	0	S	S			145	0
B. acidophilus on whey agar in 10% carbon dioxide	15	0	65	0				
B. acidophilus average in air	77	2	58	0	180	0	103	1
B. acidophilus average in carbon dioxide	15	0	34	0	0	0	25	0
Dextrose	+		—		+			
Maltose	+		—		+			
Levulose	—		—		—			
Sucrose	—		—		—			
Critical surface tension (in dynes)								
Ricinoleate	41.0		41.0				41.0	
Oleate	41.0		41.0				41.0	

E.—This product was purchased directly from its manufacturers in the far West. It is characterized by its label as "concentrated cultures *Bacillus acidophilus* minimum bacteria count 500,000,000 per cc." It bears

a date of expiration but none of manufacture. It must be borne in mind that this product was shipped across the continent by parcel post, which means a delay of approximately one week.

Table 6.—*F*

	First	Contaminants	Second	Contaminants	Aver. B. acidophilus	Aver. Contaminants
Date received	10/10		10/24			
Date examined	10/11		10/26			
Date manufactured	—					
Date expired	10/26		11/ 7			
B. acidophilus per cubic centimeter guaranteed	250					
Vehicle	Milk					
Color	Sl. caramel					
Taste	Sl. acid					
Consistency	Thick					
Cubic centimeters of tenth-normal sodium hydroxide per cc.	1.30		1.63			
Gram stain	+ short rods		+ rods			
Type of colony	X + Y		X			
B. acidophilus on casein digest agar in air	350	12	423	27	388	20
B. acidophilus on casein digest agar in 10% carbon dioxide	450	20	545	130	498	75
B. acidophilus on whey agar in air	430	27	165	0	298	14
B. acidophilus on whey agar in 10% carbon dioxide	700	90	327	1	514	46
B. acidophilus average in air	390	19	296	14	343	17
B. acidophilus average in carbon dioxide	575	55	436	66	506	61
Dextrose	+		+		+	
Maltose	+		+		+	
Levulose	+		+		+	
Sucrose	—		—		—	
Critical surface tension (in dynes)						
Ricinoleate	38.0		38.0		38.0	
Oleate	35.0		35.0		35.0	

It will be seen in table 5 that the maximum count from three samples was 180 million viable organisms per cubic centimeter, the average high count being 145 million, or less than one-half the expected number. Fermentation and surface tension tests on this culture were most unsatisfactory. After repeated efforts the final results indicated that the predominant organism deviated considerably from our stock culture of *B. acidophilus* in that the former did not ferment levulose or sucrose and could not grow at a low surface tension.

It must be concluded, therefore, that this product contains less than one-half the number of viable organisms indicated and further that the *B. acidophilus* employed is of doubtful therapeutic value as judged by laboratory criteria.

F.—This product, as with E, was purchased directly and shipped by parcel post from the West. The label reads: "Minimum Acidophilus count at expiration date 250,000,000 per cc." It bears a date of expiration but none of manufacture.

From the analyses recorded in table 6 it will be seen that this product exceeds its claim as to the number of viable organisms. However, it should be noted that in the first sample it contained a mixture of X and Y types of *B. acidophilus,* the latter predominating. In the second sample the X type were more numerous. Pure cultures of the X type differed from our stock culture of *B. acidophilus* in that the former product did not ferment sucrose and did not grow at a surface tension as low as did the latter. The character of *B. acidophilus* employed in this product is therefore open to some question.

It must be concluded that this product exceeds its claim with regard to the number of viable bacilli, but that the nature of the organisms is open to question on the grounds of therapeutic efficiency.

G.—This product was purchased in the open market through the courtesy of Dr. P. J. Hanzlik of the Stanford University School of Medicine and shipped by him across the continent by air mail. The label reads: *B. acidophilus*—a condensed pure culture—Min. Bact. Count 600,000,000 per cc. Use within eight days of this date—." When an attempt was made to purchase this product directly from the manufacturers, they refused to ship by air mail, stating that they believed the delay would impair the viability of the culture. Consequently, at our request, Dr. P. J. Hanzlik arranged to ship us this product.

It will be seen from table 7 that the maximum of viable organisms was something less than half the number claimed. Further, the same deviation from that of our stock *B. acidophilus* in fermentation and surface tension tests was noted as with F, namely, failure to ferment sucrose and to grow at a surface tension as low as 35 dynes in sodium ricinoleate.

It must be concluded that this product does not fulfil its claims.

H.—The samples of this product were ordered in advance and deliveries were made direct to use in the usual manner. There is nothing on the label to indicate the number of viable organisms at the time of sale or of the date of manufacture or expiration. Consequently, the analyses must stand by themselves.

In table 8 are given the results of the analyses on three samples of this product. It will be seen that the maximum number obtained was 170 million per cubic centimeter. The predominating organism is identical with our stock of *B. acidophilus* as to type, fermentation and surface tension capacities.

Table 7.—*G*

	First	Contaminants	Second	Contaminants	Third	Contaminants	Average B. acidophilus	Average Contaminants
Date received	10/ 7		10/19		10/22			
Date examined	10/ 7		10/20		10/22			
Date manufactured	10/ 3		10/13		10/17			
Date expired	10/11		10/21		10/25			
B. acidophilus per cubic centimeters guaranteed	600							
Vehicle	Milk							
Color	Sl. caramel							
Taste	v. sour							
Consistency	Thin							
Cubic centimeters of tenth-normal sodium hydroxide per cc.	2.62		2.73		3.17			
Gram stain	+ thick rods		+ rods — rods		+ rods cocci			
Type of colony	X		X		X			
B. acidophilus on casein digest agar in air	0	10	5	1	52	7	19	3
B. acidophilus on casein digest agar in 10% carbon dioxide	260	17	12	1	41	9	101	9
B. acidophilus on whey agar in air	0	11	14	1	8	8	7	6
B. acidophilus on whey agar in 10% carbon dioxide	215	8	8	8	5	7	110	8
B. acidophilus average in air	0	10	10	1	52	7	13	5
B. acidophilus average in carbon dioxide	238	13	12	1	23	8	106	9
Dextrose	+		+		+		+	
Maltose	+		+		+		+	
Levulose	+		+		+		+	
Sucrose	—		—		—		—	
Critical surface tension (in dynes)								
Ricinoleate	37.0		37.0				37.0	
Oleate	35.0		35.0				35.0	

Counts were made on tomato extract agar [7] as well as on casein digest agar. The results of these analyses are included in table 9.

7. Kulp, W. L.: An Agar Medium for Plating L. Acidophilus and L. Bulgaricus, Science **66**: 512-513 (Nov. 25) 1927.

It will be seen from the data in table 9 that the maximum count was 163 million per cubic centimeter, which agrees closely with the former figure of 170. However, it will be seen further that the different samples vary as to the number of viable acidophilus bacilli. Thus, the maximum number on January 23 was 65 million per cubic centimeter. The first bottle on January 28 yielded approximately the same number, namely, 80, while the second bottle examined on this date yielded 163. There were also a number of bacterial contaminants in evidence.

TABLE 8.—*H*

	First	Contaminants	Second	Contaminants	Third	Contaminants	Average B. acidophilus	Average Contaminants
Date received	9/17		9/28		1/11/28			
Date examined	9/17		9/28		1/11/28			
Date manufactured	—							
Date expired	—							
B. acidophilus per cubic centimeter guaranteed	—							
Vehicle	Milk							
Color	Sl. caramel							
Taste	Sl. acid							
Consistency	Thin							
Cubic centimeters of tenth-normal sodium hydroxide per cc	0.80		0.85		0.75			
Gram stain	+ short rods		+ rods		+ rods			
Type of colony	X		X					
B. acidophilus on casein digest agar in air	2	1	5	5	3	1	3	2
B. acidophilus on casein digest agar in 10% carbon dioxide	30	4	22	15	170	5	74	8
B. acidophilus on whey agar in air	6	0	1	1			3	1
B. acidophilus on whey agar in 10% carbon dioxide	8	8	2	1			2	1
B. acidophilus average in air	4	1	3	3	3	1	3	2
B. acidophilus average in carbon dioxide	30	4	12	8	170	5	71	6
Dextrose	+		+					
Maltose	+		+					
Levulose	+		+					
Sucrose	+		+					
Critical surface tension (in dynes)								
Ricinoleate	35.5		35.5				35.5	
Oleate	35.0		35.0				35.0	

Incidentally, it may be mentioned that tomato extract agar appears to yield lower counts than casein digest agar and that the colonies do not seem as uniformly well developed during the same period of incubation. While on the subject of suitable mediums for the counting of viable acidophilus bacilli, it may be mentioned that our results of the various analyses of acidophilus products indicate that incubation of plates in an atmosphere containing 10 per cent carbon dioxide is especially valuable for some strains of *B. acidophilus*, but that it does not offer any advantages over ordinary atmospheric incubation for other strains.

COMMENT

In commenting on the foregoing results there are two important considerations: (1) whether or not the acidophilus product in question has conformed with the specifications as noted on its label and (2) the nature of the predominating organism.

Both these considerations rest ultimately on the methods employed in analysis. These have been outlined in the section on procedure and represent the most improved methods in vogue. It is of course possible that there may be other methods than those employed which may yield totally different results, but if such exist they have not yet been published. Consequently, any conclusions drawn from the data in the present report are subject to the limitations of the methods employed.

Again, uniformity in the manufacture of acidophilus products is exceedingly difficult to maintain; in fact, variation is to be expected. Under such circumstances an acidophilus product may at one season prove satisfactory and at another fail to fulfil its specifications. Since the present report covers a period of approximately four months, most of the samples having been analyzed during September and October, 1927, our conclusions are again limited by this period of time.

It might be well to recapitulate our results in order to consider (1) whether or not the acidophilus products have conformed to specifications and (2) the nature of the predominating organisms. The summary given in table 10 serves this purpose. It will be noted that the maximum of viable organisms has been used as a criterion rather than the average number, so as to give the benefit of any doubt to the product in question. It might be more scientific to take the average counts; but in that event it would be more desirable to have a greater number of samples on which to base the averages, since the experimental error is of necessity large.

In table 10 the plus signs in the columns marked "Specified Numbers Fulfilled" indicate that the products in question have fulfilled their specifications as regards numbers, and the minus signs indicate that they have not conformed with the claim made on the label. Similarly, in the last column a plus sign indicates that the predominating organism of the product examined has the same properties as our stock culture of *B. acidophilus*, while a minus sign indicates appreciable differences. It will be seen from Table 10 that only five of the eight products examined bore any information on the label as to the number of viable organisms. And of the five that made such specification, only three fulfilled their claims. This deplorable state of affairs has already received attention.[8]

However, something may be said in extenuation of the manufacturers. Namely, they have guaranteed varying numbers of viable organisms without any fundamental experimental basis. Thus, the specifications vary from 50 to 600 millions per cubic centimeter.

TABLE 9.—*H*

	Casein Digest Agar				Tomato Extract Agar				
	Air		10% Carbon Dioxide		Air		10% Carbon Dioxide		
Date	B. acidophilus	Contaminants	B. acidophilus	Contaminants	B. acidophilus	Contaminants	B. acidophilus	Contaminants	Cubic Centimeters of Tenth-Normal Sodium Hydroxide per 1 Cc.
1/23/28	20	65	30	100	1	1	63	6	1.0
1/28/28									
No. 1	8	1	80	13	7	0	30	0	0.8
No. 2	19	0	163	4	35	0	150	0	0.8

Obviously, the manufacturer guaranteeing the latter number is at a great disadvantage. Thus, if all the counts were based on a guarantee of 50 million, as is the case with the B and C products, all of the acidophilus products examined would have exceeded this number (with the exception of A which appears to contain *B. bulgaricus*). It must be confessed that the time has

8. James, L. H.: Bacillus Acidophilus and Bacillus Bulgaricus Cultures and Preparations: Bacteriologic Status, J. A. M. A. **89**: 89-92 (July 9) 1922.

long been ripe for a scientific determination of the minimum number of viable acidophilus bacilli requisite for therapeutic results. Whatever notions exist are based solely on personal observation. Our experience indicates that a daily dose of 1 quart of acidophilus milk containing not less than 100 million organisms per cubic centimeter is necessary to alleviate severe chronic constipation or acute diarrhea within two weeks. A lesser number of viable organisms ingested for a longer period of time may be, in all probability, beneficial. In any event it would appear reasonable that a minimum standard of viable organisms be established for all acidophilus products and that no manufacturer need exceed this number unless he so desires. Before such a standard can be established, however, scientific experimentation is required.

Only three of the products analyzed contained *B. acidophilus* predominantly which conformed in its properties to our stock culture. And only one of the two products C fulfilled its specifications as to the numbers of viable organisms.

The matter of the strain of *B. acidophilus* employed raises a question as to the therapeutic efficiency of the product. It has been scientifically established that the X type of *B. acidophilus* which ferments dextrose, maltose, levulose and sucrose and, further, which grows at a surface tension of 35 dynes in sodium ricinoleate solutions, is capable of inducing a transformation of the intestinal flora with a consequent alleviation of chronic constipation or diarrhea. But can this be said for strains which differ from the X strain with regard to fermentation and surface tension capacities? Until their therapeutic efficacy is scientifically determined it were best to suspend judgment.

A further recommendation based on the present analyses is that each acidophilus product should bear the following data on its label:

1. Date of manufacture.
2. Minimum number of viable organisms (*B. acidophilus*) at time of manufacture.
3. Minimum number of viable organisms (*B. acidophilus*) at time of earliest possible sale under ordinary conditions.
4. Date of expiration.
5. Minimum number of viable organisms (*B. acidophilus*) at date of expiration.
6. Type of *B. acidophilus* predominating.

These requirements need little explanation. The date of manufacture and the minimum viable number of acidophilus bacilli at that time indicate the best that can be expected from a product. The minimum number at the time of the earliest possible sale under normal conditions gives a practical index of the utility of a product. Thus, a company which has direct distributing facilities might be expected to show higher counts than companies relying on indirect or mail distribution, all other things being equal. The date of expiration and the number of viable acidophilus bacilli at that time indicate the least that may be expected of a product and, when taken in conjunction with the date of manufacture, may well serve as a practical guide to the deterioration of the product. The type of *B. acidophilus* employed indicates its therapeutic value.

SUMMARY

Within the limitations of the methods employed and our present knowledge of *B. acidophilus*, the following points have been established:

1. Only five of the eight products examined bore any information on the label as to the number of viable organisms. And of the five that made such specification, only three fulfilled their claims.

2. Three of the seven acidophilus products examined contained *B. acidophilus* predominantly, identical in morphologic and physiologic properties (as determined by fermentation and surface tension tests) with our stock culture of *B. acidophilus*.

3. Only one acidophilus product of the seven examined contained the specified number of viable organisms identical in nature with our stock culture of *B. acidophilus*.

4. It is recommended that the labels of all acidophilus products bear the following information: (*a*) date of manufacture; (*b*) minimum number of viable organisms (*B. acidophilus*) at time of manufacture; (*c*) minimum number of viable organisms (*B. acidophilus*) at time of earliest possible sale under normal conditions; (*d*) date of expiration; (*e*) minimum number of viable organisms (*B. acidophilus*) at date of expiration; (*f*) type of *B. acidophilus* predominating.

TABLE 10.—*Summary*

Name	Number of Acidophilus Bacilli Guaranteed	Maximum Number of Acidophilus Bacilli Found	Specified Numbers Fulfilled	Type of B. acidophilus	Fermentation				Surface Tension in Dynes		B. acidophilus Compared with Stock B. acidophilus
					Dextrose	Maltose	Levulose	Sucrose	Ricinoleate	Oleate	
Stock B. acidophilus.....	200	350	+	X	+	+	+	+	35.0	35.0	
A.....	—	40		?	+	—	—	—	43.0	48.0	—
B.....	50	900	+	Y	+	+	+	—	36.5	35.0	—
C.....	—	60		X	+	+	+	+	35.5	35.0	+
D.....	250	130	—	X	+	+	+	+	36.0	35.0	+
E.....	500	180	—	X	+	+	—	—	41.0	41.0	—
F.....	250	700	+	X + Y	+	+	+	—	38.0	35.0	—
G.....	600	200	—	X	+	+	+	—	37.0	35.0	—
H.....	—	170		X	+	+	+	+	35.5	35.0	+

Infected Oysters.—The danger from typhoid fever and other enteric diseases to which consumers of raw oysters, contaminated by intestinal or urinary discharges, are subject, has been too well established by a number of careful epidemiological studies to permit any doubt concerning its possible magnitude. Perhaps the most extensively known epidemic of typhoid fever attributable to oysters occurred during the winter of 1924-1925, when an estimate based on morbidity and mortality records indicated that during the months of November and December, 1924, approximately 1,500 cases and 150 deaths from typhoid fever occurred in the major cities of New York, Chicago, Washington, and in ten smaller cities. The epidemic was carefully studied by Lumsden and his associates as well as by the state and city health officials of the areas affected. The exact percentage of these cases caused by eating infected oysters cannot be estimated, although a study of the extensive data presented by Lumsden leaves little doubt that practically all may have been caused in this way.—Perry, C. A.: Studies Relative to the Significance of the Present Oyster Scare, *Am. J. Hyg.*, September, 1928.

Council on Pharmacy and Chemistry

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

W. A. PUCKNER, Secretary.

DIPHTHERIA IMMUNITY TEST (SCHICK TEST) (See New and Nonofficial Remedies, 1928, p. 390).

H. K. Mulford Company, Philadelphia.

Diphtheria Toxin for the Schick Test (see New and Nonofficial Remedies, 1928, p. 291): Also marketed in packages of two 10 cc. vials (M 213), one containing undiluted diphtheria toxin and the other containing sufficient sterile solution of sodium chloride for dilution to make 100 test doses of 0.1 cc. Schick Test Control is also supplied in packages of one 10 cc. vial (M 214), containing heated and diluted diphtheria toxin sufficient for at least 100 tests.

TETANUS ANTITOXIN, CONCENTRATED (See New and Nonofficial Remedies, 1928, p. 356).

Parke, Davis & Co., Detroit.

Tetanus Antitoxin Globulin.—Also marketed in piston syringe containers, containing 20,000 units (Bio. 149).

DIPHTHERIA TOXIN-ANTITOXIN MIXTURE

(See New and Nonofficial Remedies, 1928, p. 366, and THE JOURNAL, Oct. 13, 1928, p. 1109.

United States Standard Products Co., Woodworth, Wis.

Diphtheria Toxin-Antitoxin Mixture 0.1 L+ (Non-Sensitizing).—Each cubic centimeter constitutes a single dose of diphtheria toxin neutralized with the proper amount of antitoxin produced from goats. Marketed in packages of three vials, each containing 1 cc.; in packages of one vial containing 10 cc.; and in packages of one vial containing 30 cc.

PRELIMINARY REPORTS OF THE COUNCIL

THE COUNCIL HAS AUTHORIZED PUBLICATION OF THE FOLLOWING PRELIMINARY REPORT.

W. A. PUCKNER, Secretary.

OVARIALHORMON FOLLICULIN MENFORMON

In a paper, "A Female (Sexual) Hormone, Menformon, and Standardized Ovarian Preparations," which appears in this issue, Dr. Ernst Laqueur reports on the method of obtaining and standardizing "Menformon," a preparation said to contain a solution of a "female sexual hormone." When this paper was accepted for publication, the Council was requested to report on the proprietary product referred to therein. According to this paper, an ovarian preparation made on the basis of the work of Dr. Laqueur is marketed as Ovarialhormon Folliculin Menformon, by Organon Limited, Oss, Netherlands, and Degewop Limited (Gesellschaftwissenschaftlicher Organpräparate A.-G.), Berlin, Germany. The product of the latter firm is marketed in the United States by the Marvell Pharmacal Company, New York. This firm requested consideration of the product by the Council, submitting specimens containing 4 mouse units per 1 cc. ampule and later ampules of 1 cc. containing 40 mouse units.

Inquiries were addressed to the Marvell Pharmacal Company, to Degewop Limited, and to Dr. Laqueur regarding the method of preparing and standardizing the commercial product and regarding any evidence available to show the clinical value of the product. According to Dr. Laqueur, the commercial product may be obtained (*a*) from the placenta of women and animals by a method described in the *Lancet*, May 28, 1927, p. 1126; (*b*) from the liquor folliculi of cattle by a method described in *Proceedings of the Royal Academy of Science*, Amsterdam **28,** number 10, 1925, and (*c*) from the urine of pregnant women by a modification of the method given for extraction from the liquor folliculi under *b*. In his paper, he states that Menformon may be obtained from the urine and testes of normal men. According to a letter from Degewop Limited, forwarded to the Council by the Marvell Pharmacal Company, essentially the same methods are used in the manufacture of the commercial product. These methods as given are so general in character that they cannot be taken as establishing the character or identity of Ovarialhormon Folliculin Menformon.

According to information sent by Dr. Laqueur, and confirmed by information sent by Degewop Limited through the Marvell Pharmacal Company, the preparation is standardized in terms of its effect on spayed mice, one mouse unit being the quantity (divided into six injections within forty-eight hours) necessary to induce estrus in 75 per cent of the injected animals as judged by the smear method. According to Dr. Laqueur's paper, 4 mouse units are about equal to 1 rat unit as used by Allen and Doisy. Assays of the 4 and the 40 mouse unit varieties of Ovarialhormon Folliculin Menformon were made by consultants of the Council. The consultant who tested the 4 unit specimen reported that the specimen which he examined titered exactly as claimed; the other consultant reported that the 40 unit specimen sent the Council by the Marvell Pharmacal Company showed from 10 to 11 rat units per cubic centimeter, which, according to the equivalents given by Dr. Laqueur, is from 40 to 44 mouse units.

There appears to be some question as to the matter of dosage for the product. A trade package circular for Ovarialhormon Folliculin Menformon (the 40 M. U. per cc. form) suggests from one to thirty ampules in cases of long-standing amenorrhea, which would be from 40 to 1,200 mouse units or 10 to 300 rat units. In his paper Dr. Laqueur states: "At present it is our opinion that doses of from 80 to 800 mouse units may prove satisfactory, though Löwe advocates still larger amounts." If this is correct, it would appear futile to expect results from the use of the 4 mouse unit per cc. form of Ovarialhormon Folliculin Menformon.

In view of the paucity of clinical evidence contained in the literature, the Council asked Dr. Laqueur as well as the American agent and the German manufacturer of Ovarialhormon Folliculin Menformon for published evidence for the therapeutic value of the product. The German firm sent a number of reprints of articles from German publications, which appear to contain no convincing data concerning the therapeutic use of the product in man. The firm also submitted a bibliography covering the years 1925-1928. Dr. Laqueur stated in effect that up to the present little had been published, the most important thus far being a recent paper by Prof. Fränkel of Breslau (*München med. Wchnschr.*, 1928, number 18, p. 780). On consulting this publication it was found to contain no acceptable clinical evidence for the value of Ovarialhormon Folliculin Menformon.

The Council postponed consideration of the acceptance of Ovarialhormon Folliculin Menformon for New and Nonofficial Remedies to await confirmative evidence for its therapeutic value and more definite information with regard to the identity of the product.

REPORTS OF THE COUNCIL

THE COUNCIL HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORTS.

W. A. PUCKNER, SECRETARY.

THYANGOL PASTILLES NOT ACCEPTABLE FOR N. N. R.

Thyangol-Pastilles are prepared by Dr. Thilo and Co., Mainz, Germany and are distributed in the United States by Sterling Products Corporation, New York. According to the label, each pastille contains: "Anaesthesin 0.03, Phenacetin 0.08, Thymol, Menthol, Oleum Eucalypti āā. 0.0015, Sacch. alb. ad 1.0 gr." In this statement "gr." stands for gram; therefore each pastille contains 0.03 Gm. of Anesthesin (ethyl aminobenzoate, U. S. P.) and 0.08 Gm. of Phenacetin (acetphenetidin, U. S. P.) in a base of sugar with aromatic oils. The use of the pastilles is proposed by the manufacturer in coughs and angina, dysphagia and pains in swallowing due to various causes, and in dental practice to reduce sensitiveness when taking casts.

The advertising for Thyangol-Pastilles consists largely of uncritical testimonials given in return for free samples received. The following are typical: "I herewith beg to inform you that my trials with Thyangol Pastilles in cases of catarrh of the mucous membranes have proved very successful. A case of acute angina, from which my little son, five years of age, suffered and which appeared to be very serious, was successfully treated and altogether removed in two days." "My best thanks for the sample package of your Thyangol Pastilles which you kindly forwarded. As I happened to be suffering from angina at the time of their arrival, I had an opportunity of trying them on myself. I can corroborate the fact that their use led to an improvement in short time and finally to the disappearance of the complaint."

The Council finds Thyangol-Pastilles unacceptable for New and Nonofficial Remedies because the routine administration of a mixture of ethyl aminobenzoate and acetphenetidin is irrational; because the claims are exaggerated; and because the name is not descriptive of the potent ingredients.

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SATURDAY, OCTOBER 20, 1928

PULMONARY ADJUSTMENTS TO THE NEED OF OXYGEN

The effective physiologic adjustments of the organism to the literally enormous variations in the functional demands made on individual organs and tissues from time to time are among the remarkable features of biologic organization. At one moment certain structures are extremely quiescent, whereas in a succeeding interval they may become involved in intense activity calling for marked chemical and physical changes within a short time. Satisfactory compensatory responses almost always ensue promptly during health.

The transition from bodily rest to vigorous muscular activity is an illustration of what may be demanded of the organism in the way of rapid adjustment. Alterations of temperature must be averted by regulatory devices; pabulum must be made available for the transformation of energy; and, above all, oxygen must be supplied locally in enormously augmented amounts while carbon dioxide and other catabolites are being removed from the locus of contractile changes. The heart responds quickly by pumping more blood within a given period to the external respiratory mechanisms in the lungs. The pulmonary system must adjust not only to receive but speedily to return large increments in its blood. Wiggers[1] has therefore remarked that whenever the systolic discharge of the right heart exceeds that of the left—as may conceivably happen either when the systemic venous inflow increases or the systemic arterial resistance is greatly raised—intense pulmonary congestion must inevitably occur unless compensatory mechanisms are set in operation. With the pulmonary volume so intimately dependent on the relative discharges by the two sides of the heart it is wonderful, as Henderson and Prince have noted, not that pulmonary congestion sometimes occurs but rather that it is not commonly caused. It is still more remarkable, they add, that a condition of pulmonary depletion is unknown either to physiology or to clinical medicine.

When the compensatory mechanism is reacting effectively so that larger volumes of blood are brought to the lungs for aeration, it might be expected that respiration would be greatly augmented in volume, in depth or in both. Such responses to functional demands actually occur. Recent studies in the measurement of cardiac output in rest and in exercise have shown that the pulmonary circuit as a whole may suddenly be called on to handle a fourfold increase in volume flow per minute. Observations by Churchill[2] at the Massachusetts General Hospital in Boston show that in addition to the alteration in the rate and depth of breathing occasioned by demands for increased oxygenation of the blood there may be a further compensatory mechanism in the form of an actual increase in the effective diffusing surface. Undoubtedly such a mechanism would tend to be closely linked with the alteration in breathing in helping to satisfy the increased oxygen demand usually associated with physiologic increases in blood flow. The increase in oxygen absorption is shown to take place even when the respiratory minute volume remains the same or is actually decreased. Conceivably the functionally diffusing surface may be enhanced by enlargement of the capillary bed in the lung. Sluggish areas may be brought into active circulation. Reserve capillary paths may be brought into requisition; and the small vessels may even actively open through the agency of their inherent function of contractility. Finally, the success of such an adjustment is indicated by the circumstance that the total surface of the capillaries is estimated at 90 square meters in the lungs of man—an area of diffusion presumably sufficient to permit almost instantaneous adjustments of gaseous equilibriums on a large scale.

OVARIAN HORMONES AND OVARIAN ORGANOTHERAPY

The evidence from the experimental laboratories and the clinics, accumulated especially during the last few decades, points to the conclusion that the mammalian ovaries exercise their influence on the so-called secondary sex characters and the sex life of the mammalian female through the mechanism of the hormone or hormones produced by some element in the ovary. It is therefore rational to treat or attempt to treat symptoms due or presumably due to ovarian insufficiency by substitution therapy. This has had extensive trial for years, use being made of fresh whole ovaries, dried and defatted ovarian substances, and various fractions isolated from the ovaries of the lower mammals. In general these ovarian substances have been given by mouth. Summing up the results of these extensive clinical tests in 1924, Novak[3] says: "The results are rarely striking and often nil to the level-headed

1. Wiggers, G. J.: The Regulation of the Pulmonary Circulation, Physiol. Rev. **1**: 239 (April) 1921.

2. Churchill, E. D.: The Effect of Increased Blood Flow on the Ratio Between Oxygen Consumption and Pulmonary Ventilation, Am. J. Physiol. **86**: 274 (Sept.) 1928.

3. Novak, Emil: Ovarian Therapy, J. A. M. A. **83**: 2016 (Dec. 20) 1924.

observer. It cannot be assumed that a commercial extract can replace the normal ovarian secretion in the patient's body, or, for that matter, that it originally contains any of the active hormones of the ovary. Here lies the crux of the whole problem, whose solution will depend in large measure on the work of the biochemist."

Biochemistry has not been neglectful of this problem. Allen and Doisy, and Frank and Gustafson, among others, have worked on the separation and concentration of the so-called follicular ovarian hormone. Curiously enough, the active substance in this preparation is apparently not soluble in water or salt solution but soluble only in fat solvents, such as alcohol or ether. This preparation, administered parenterally, is reliably reported to stimulate uterine growth and to introduce changes similar to estrus, or heat, in spayed rats, mice, guinea-pigs and monkeys. To date the use of this follicular hormone on patients has been neither extensive nor encouraging in definite results.

In this issue of THE JOURNAL Professor Laqueur [4] and collaborators of the University of Amsterdam report an interesting series of experiments in the same field. These investigators appear to have succeeded in obtaining a water-soluble hormone from the ovaries, or at least a preparation that produces uterine, mammary and vaginal changes similar to those reported from the administration of the follicular hormone of Allen, Doisy, Frank and Gustafson. It is not surprising that Laqueur reports the finding of this substance or hormone in the urine of women, since analogous substances (enzymes and vitamins), especially when present in excess in the blood, appear freely in the urine of normal persons. It is extraordinary, however, and indeed somewhat disquieting, to learn that Laqueur has been able to secure his material ("Menformon") not only from the ovaries and urine of women and the lower mammals but also from the testes and urine of normal men. This raises, of course, the question of specificity and whether the vaginal reactions so largely used in the laboratory study of these hormones in recent years are really reliable criteria of ovarian hormone action. As in the case of the follicular hormone of American workers, the "Menformon" of Laqueur has as yet too scanty clinical trial to warrant prophecy as to its future value in that field. These various ovarian preparations that now seem sufficiently purified to be introduced hypodermically without serious results to the patients should be given trial in definitely uncomplicated ovarian deficiency such as the clear menopause symptoms, artificial or natural, in order that more may be learned as to their actual effects. In most of the other disturbances of the sex life of women, other factors than ovarian functions are frequently primarily involved. Negative results are therefore of little value in guiding further investigations in this important field.

4. Laqueur, Ernst; and De Jongh, S. E.: A Female (Sexual) Hormone, this issue, p. 1169.

TONSILLECTOMY IN THE UNITED STATES

The day of the pioneer in the field of focal infection is over. Both the medical profession and the public have become so well aware of the importance of local infection in the genesis of systemic disease that removal of infected foci has assumed a commanding lead in all surgical procedures. A recent government report [1] estimates that about one third of all operations since 1924 among the American urban population were for the removal of tonsils or adenoids. The urgent need for comprehensive statistical studies of the results to date is apparent.

Kaiser [2] reported on 48,000 school children, in 20,000 of whom the tonsils had been removed and in 28,000 of whom they had not been removed. He found the incidence of rheumatic fever, joint pains or growing pains and chorea slightly less in the tonsillectomized patients than in those whose tonsils had not been removed, but the difference was so slight as to be almost negligible. However, he calls attention to the fact that many with rheumatic manifestations in the tonsillectomized group had had their symptoms before operation. Scarlet fever occurred in 7.6 per cent of those who had had their tonsils removed and in 16 per cent of those who had not had them removed. The former group had fewer cardiac complications than the latter. Rheumatic heart disease was found in 450 of the 20,000 tonsillectomized children and in 817 of the 28,000 not operated on. Many of the first group developed heart disease before tonsil removal.

The report of Collins and Sydenstricker [1] contains data on some other points. They found a decrease in all respiratory diseases in tonsillectomized persons. In Hagerstown, Md., from 1921 to 1925, the average illness rate due to tonsillitis and sore throat per thousand children for the school year of 180 days was 120 for tonsillectomized children, 206 for those with "normal" tonsils and 266 for those with "defective" tonsils. The difference in the incidence of other respiratory diseases, namely, "colds," grip and influenza, was also in favor of the tonsillectomized group, but only to a slight degree.

Morbidity from nonrespiratory causes was not materially lessened by tonsillectomy. In the Hagerstown children the illness rate for rheumatism, lumbago, neuritis, cardiac conditions, ear diseases and cervical adenitis was even slightly higher in the group that had undergone tonsillectomy than in those not operated on. The investigators did not conclude that tonsillectomy increases the susceptibility to these conditions. The only conclusion allowable is that tonsillectomy did not, of course, cure long-standing chronic conditions, such

1. Collins, S. D., and Sydenstricker, Edgar: An Epidemiological and Statistical Study of Tonsillitis, Pub. Health Bull. 175, 1927.
2. Kaiser, A. D.: Incidence of Rheumatism, Chorea and Heart Disease in Tonsillectomized Children: A Control Study, J. A. M. A. 89: 2239 (Dec. 31) 1927.

as cardiac injury, for which the diseased tonsils may have been responsible in the first place.

The figures on the effect of tonsillectomy on the incidence of contagious diseases are most interesting. During the four year period more scarlet fever, mumps, measles, whooping cough and chickenpox occurred in the tonsillectomized group than in the nontonsillectomized. Diphtheria alone was less prevalent in those with tonsils removed, the rate being 4.6 cases per thousand in the nontonsillectomized as against 1 per thousand in those who had undergone the operation.

Altogether, the data of Collins and Kaiser indicate that tonsillectomy is a useful and justifiable procedure, but the benefits when a large control group is compared are not so striking or so universal as could be desired.

In this issue of The Journal, Rhoads and Dick [3] call attention to one common cause of poor results. They found in routine physical examinations of young women that, in 73 per cent of those who had been subjected to operations for the removal of tonsils, fragments of tonsillar tissue of appreciable size remained in the throat. By quantitative bacteriologic methods they showed that such fragments contained more pathogenic bacteria per gram than tonsils removed for the first time. Cases are cited in which systemic disease, because of which tonsillectomy was undertaken, did not clear up until "tonsil stubs" remaining from the first operation were removed. Their results indicate that incomplete removal of tonsils in many instances leaves a patient in worse condition than he was before operation. While this is not the whole solution of the tonsil problem, it is an important point that deserves the careful attention both of internists and of those who remove tonsils.

Another interesting feature of the tonsil situation is the lack of unanimity of opinion as to the indications for tonsillectomy. In the government survey, tonsils are listed as "diseased," "enlarged" or "normal." Both of the first two divisions are included under "defective tonsils." However, there are no definite criteria for these divisions. The examiners made their decisions merely from "appearance and such related conditions as might be observed in a single examination." Ragged and cryptic tonsils were placed in the "diseased" tonsil class; "enlarged" were rated as "defective" but not "diseased." Such a division was probably the most workable one possible, but the wide variations in reports of examiners in neighboring school districts attest the drawbacks of such a classification. In the four communities studied—Pinellas and Orange counties of Florida; Dunklin County, Mo., and Hagerstown—the incidence of "diseased" tonsils varied from 7 to 23 per cent, "enlarged" (whether "diseased" or not) from 19 to 42 per cent, and "defective" ("diseased," "enlarged" or both) from 22 to 53 per cent among white children of all ages.

3. Rhoads, P. S., and Dick, G. F.: Efficacy of Tonsillectomy for the Removal of Focal Infection, this issue, p. 1149.

Granting that the "diseased" tonsils referred to show morbid changes of some kind advanced and apparent enough to indicate tonsillectomy, the question of the significance of the "enlarged" and "normal" tonsils remains. Collins and Sydenstricker found enlarged tonsils most frequently in children aged from 6 to 11 years, with a steady decrease beyond this. If considerable hyperplasia of tonsil tissue is physiologic at this age, one can hardly regard tonsils that are merely enlarged as "defective." However, if the hypertrophy is a response to increased infection, which becomes almost inevitable when a young child enters school and increases his contacts with persons with infected respiratory tracts, such tonsils probably should be regarded as "diseased." Such writers as Machlachlan [4] and Hays [5] have stated that tonsillar hypertrophy always has an inflammatory basis, though the amount of infection may not always be proportional to the amount of hypertrophy. While this view is generally accepted there is no universal agreement that this constitutes a reason for removing such tonsils, particularly if there is no evidence that drainage from the crypts is being obstructed.

Of late years there has been a tendency to pay more attention to small, scarred and possibly innocent appearing tonsils as foci of infection. Hill [6] says: "For the most part the ordinary inspection of the pharynx which passes for an examination is worthless to determine if the tonsils are infected or not. . . . The size of the tonsil is of little importance unless obstructive to breathing. These large tonsils drain fairly well and are of pathologic significance only as to their local manifestations as the cause of sore throats. The most important type of tonsil is usually overlooked. This is the small, buried tonsil, sometimes almost atrophic, with its crypts more or less sealed, and with the products of infection draining into the system, via the lymphatics in the blood stream." Caylor and Dick [7] showed by quantitative bacteriologic methods that small, scarred tonsils, the seat of frequent throat infections, harbored more pathogenic bacteria per gram than so-called hypertrophied tonsils.

The presence of systemic disease attributable to focal infection in which no other foci can be found appears to present a definite indication for tonsillectomy, regardless of the appearance of the tonsils. It should not, however, be the only indication, because it is comparable in some degree to closing the barn door after the horse is out.

Visibly "diseased" tonsils doubtless should come out on suspicion. Among these are four chief types

4. Machlachlan, W. W. G.: Tonsillitis: A Histopathological Study, University of Pittsburgh Medical School Pathological Laboratory Publications, September, 1912.

5. Hays, H. M.: Disease of the Pharynx, Nasopharynx and Hypopharynx, in Abt's Pediatrics, Philadelphia, W. B. Saunders Company 3, 1924.

6. Hill, F. F.: What is Wrong with the Tonsil Operation? Ann. Otol., Rhin. & Laryng. 35: 913 (Sept.) 1926.

7. Caylor, H. D., and Dick, G. F.: Quantitative Bacteriology of Tonsils, J. A. M. A. 78: 570 (Feb. 25) 1922.

described by Shambaugh:[8] (1) enormously enlarged tonsils in children or adults, especially in association with systemic disease; (2) very small fibrous tonsils of adults; (3) tonsil "stubs" remaining from previous tonsil operations, ignipuncture and surface cauterization; (4) small tonsillar abscesses beneath the surface. Most writers agree that persistent cervical adenopathy without definite sinus or other infection to account for it constitutes another reason for tonsillectomy. There are no doubt others. When the operation is undertaken, the tonsils should be removed completely or not at all.

Current Comment

RAT-BITE FEVER

The history, temperature curve and eruption, and the discovery of *Spirillum minus* in the blood identify clinically the tropical disease found most frequently in Japan and India, and known as rat-bite fever. McDermott[9] states that it has long been known to the physicians of Japan and was clearly described by Katsura in 1892. In 1902 Miyake[10] gave it the name of sodoku, "rat poisoning" or "rat-bite sickness." Since then cases have been reported throughout the world. The organism was first found in a rat by Vandyke Carter[11] in Bombay in 1887. It was first isolated from man by Futaki and his co-workers[12] in Japan in 1916. It was next isolated from a man in India by Row[13] in 1917. The disease results from the bite of a rat or of some animal such as a ferret, cat or dog that has come in contact with a rat. According to Parmanand,[14] the chief host of the organism is the lesser bandicoot, *Norvegicus bengalensis*, a species of rat found in India. He found it in about 10 per cent of the number that he examined. The country of origin of rat-bite fever has not yet been definitely determined. Japan and India must be considered, also America, as Wilcox[15] in 1840 described a case of "poisoning from a rat bite" that tallies with the present description of rat-bite fever. Knowles and Das Guptas[16] consider it an Indian disease and offer as evidence the fact that the organism was first found in an Indian rat by Carter in 1887, that it is now found in about 20 per cent of the rats in the city of Calcutta, and that the disease has been reported from all over India. Rat-bite fever has long been known in Japan, but proof has not established its origin there. Thus it is quite likely that *Spirillum minus* is not yet to be robbed of its "free-lance" activity in making rat-bite fever a disease of world-wide origin.

8. Shambaugh, G. E.: The Faucial Tonsil as a Focus for Systemic Infection, Tr. Am. Laryngol. A. **35**: 53, 1913.
9. McDermott, E. N.: Rat-Bite Fever: A Study of the Experimental Disease, with a Critical Review of the Literature, Quart. J. Med. **21**: 433 (April) 1928.
10. Miyake: Mitt. a. d. Grenzgeb. d. Med. u. Chir., 1902.
11. Carter, Vandyke: Note on the Occurrence of a Minute Blood Spirillum in an Indian Rat, Sc. Mem. Med. Off. Army of India, 1887, part 3, p. 45.
12. Futaki, K.; Takaki, J.; Taniguchi, T., and Osumi, S.: The Cause of Rat-Bite Fever, J. Exper. Med. **23**: 249 (Feb.) 1916.
13. Row, R.: On a New Species of Spirochaete Isolated from a Case of Rat-Bite Fever in Bombay, Indian J. M. Research **5**: 386 (Oct.) 1917.
14. Parmanand, M. J.: Rat-Bite Fever, with Special Reference to Its Aetiological Agent, Indian J. M. Research **13**: 609 (April) 1925.
15. Wilcox: Am. J. M. Sc. **26**: 245, 1840.
16. Knowles, R., and Das Guptas, B. M: Rat-Bite Fever as an Indian Disease, Indian M. Gaz. **63**: 493 (Sept.) 1928.

FURUNCULOSIS IN INDUSTRY

Occupational furunculosis has become so prevalent as to be known by identifying names applicable to the trades in which it occurs. "Salt infection," reported by Thurber,[1] and "sugar boils," described by Young,[2] are recent instances. Medical literature reveals its common occurrence among ice cream handlers, beet sugar workers, butchers, lathe operators, bakers, oil workers, machinists, soap makers, tallow refiners, cold storage workers, fertilizer makers, tar workers and street sweepers. The individual cases in each locality may be few, but their number in the aggregate demands attention. In ice cream handlers, in whom the skin is exposed to rock salt and water, salt infection is said to be due to "seeding" the hair follicles with pyogenic organisms normally found on the body and in the extraneous dirt that comes in contact with the skin. In beet sugar workers, sugar boils are said to be due to sugar dust and perspiration forming a culture medium suitable for the proliferation of these organisms on the body surface. In lathe operators it is said to be due to an infection of the minute wounds made by small pieces of metal that pierce the skin in the course of the work, or to the sealing up of organisms in the hair follicles by the oil that comes in contact with the skin, or to organisms being deposited there by the oil. In cold storage workers it probably results from lowered body resistance due to the sudden and frequent changes in temperature. In the other occupations it is also a natural outcome of the job in which the organisms normally found on the skin get a foothold as a result of conditions under which the work is done. It is the most common skin disorder among workers in the oil and sugar industries and is frequent in all occupations in which workers use their hands. The disease may be localized or systemic, depending largely on the general condition of the patient. If it becomes systemic it may lead to osteomyelitis, pericarditis or endocarditis. The organisms most commonly found are *Staphylococcus albus* and *aureus*. Such disease conditions hamper industrial progress, causing workers to seek other employment and raising multiple questions of compensation. Here again manual labor becomes martyr to the microbe.

THE SUMMER CAMP FOR CHILDREN

Now that the summer camps have lowered their flags and closed for the season of 1928, it may be well to consider briefly some of the points in relationship to hygiene and sanitation which are concerned in their operation. These should be given careful thought not only by camp directors and physicians, but by the hundreds of thousands of parents who have consigned their children to such vacation resorts without, in many instances, even a preliminary casual inspection. At least 15,000 such camps were operated in the United States during the past season, and the number of children in camps at one time or another was in the millions. The medical attention available in the average summer camp

1. Thurber, Floyd: Occupational Skin Disease from Exposure to Rock Salt and Water, J. A. M. A. **90**: 540 (Feb. 18) 1928.
2. Young, F. B.: Infections Incident to the Beet-Sugar Industry, Nebraska M. J. **13**: 349 (Sept.) 1928.

varies from nothing at all to the presence of a practical nurse, to the employment of several graduate nurses, to the residence of a physician within 25 miles, to the employment of interns, and, finally, to the presence of a graduate licensed physician who devotes all his time during the two months to problems of health and sanitation in the camp in which he may reside. The facilities within camps for the care of a sick child or a surgical emergency vary from a tent with a cot to the well established, fully organized infirmary with four beds. The sanitation of the camps may include a carefully checked milk, water and food supply, hot and cold water, shower baths, screened cabins, paved walks, and modern plumbing, with daily inspection of the children. It may, however, depend on uncontrolled springs and inadequate chemical disposal of sewage. So rapid has been the growth of the camp movement in this country that there are only a few states, possibly two, which arrange for regular inspection of summer camps by their health departments. Unquestionably, some authoritative body should draw up minimum standard requirements for sanitary and hygienic control of summer camps for children. Parents who insist on the best medical attention for their children during the winter months delegate them, without any idea of possible dangers, to camps far removed frequently from any physician. The subject is one to which state health officers particularly and public health officials generally may well give some thought.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

CALIFORNIA

Personal.—Dr. Benjamin W. Black, Oakland, has been appointed a member of the medical council of the U. S. Veterans' Bureau. Dr. Black was formerly medical director of the veterans' bureau.——Jean Walker Macfarlane, Ph.D., and Albertine Richards Nash, Ph.D., addressed the San Francisco County Medical Society, September 11, on "Medicopsychologic Problems from the Standpoint of the Psychologist"; Dr. Olga L. Bridgman, "Mental Problems of Children," and Dr. Robert L. Richards, "The Genesis of Adult Maladjustments."——Dr. Oran Newton has succeeded Dr. Harrison M. Hawkins as health officer of Taft.

Rabies Extends Over the State.—The bulletin of the state department of public health notes that 498 rabid animals had been reported up to September 1 this year, a larger number than had been reported in any entire year since 1920, except 1923, when 1,092 rabid animals were reported. Most of the cases had been in dogs. There have been some in cows, cats, horses, goats, mules, sheep, hogs, foxes, skunks and coyotes. Thirty-nine human deaths from rabies have occurred in California since 1920. Within the last year, rabies has extended to the northern part of the state, where it has been reported in the Sacramento Valley, the San Joaquin Valley and in three of the north coast counties. In 1915, when rabies was very prevalent in dogs and coyotes in northeastern California, large sums of money were expended by the federal and state governments to stamp out the disease. The health department emphasizes that if each city and county enforced ordinances to place all stray dogs under control, rabies would soon be reduced to a minimum. The Pasteur treatment will prevent the development of rabies in most cases if administered promptly, but prevention is a much better way to solve the problem.

Society News.—The program of the October 9 meeting of the San Francisco County Medical Society was presented by the University of California Medical School; Drs. Charles L. Connor read a paper on "Experimental Sarcoma in Chickens"; Ian Maclaren Thompson, on "Anatomy of the Central Nervous System from the Diagnostic Point of View"; Chauncey D. Leake, Ph.D., "Tercentenary of Harvey's Work on the Circulation," and James M. Olmsted, Ph.D., "Measurement of Excitability of Nerves." The members of the society have been invited to attend the clinical pathologic conferences held at San Francisco Hospital every Tuesday at 11 o'clock, and at the University of California Hospital every Wednesday at 9.——The San Francisco Ladies' Protective and Relief Society has called to the attention of members of the medical society its home at 440 Laguna Street, in which eighteen beds are reserved for convalescents. Admissions are made on the recommendations of physicians. Cases of tuberculosis, or mental or malignant disease are not accepted. The charge is $1 a day, and if circumstances demand terms can be arranged to delay the payment. There is a large garden with sheltered court.——Santa Cruz County has provided for the treatment of indigent cases of tuberculosis by the erection of a tuberculosis pavilion which opened, October 1, with a capacity of sixteen beds; Dr. Samuel B. Randall, county physician, will be in charge of the unit.——The new school of medicine at the University of Southern California opened, September 19, with fifty-four students admitted out of 200 applicants. Dr. Llewellyn C. Kellogg, formerly of Loma Linda, has been appointed acting professor of anatomy, and Dr. Ernest M. Hall, formerly of Stanford University School of Medicine, acting associate professor of histology.

ILLINOIS

Society News.—The Adams County Medical Society voted in September to establish a modern medical library in Quincy.——Dr. Jonas C. Lyter, St. Louis, addressed the Macoupin County Medical Society, Carlinville, September 25, on "Medical Aspects of Thyrotoxicosis."

Chicago

Dedication of Statue of Pasteur in Grant Park.—Physicians and friends are invited to attend the dedication of the statue of Louis Pasteur, located near the west end of the Field Museum, in Grant Park, October 27, at 3 p. m. The French ambassador to the United States will make a brief address and the French Choral Society will sing. In the evening, the Pasteur Memorial Committee will give a banquet at the Drake Hotel in honor of the ambassador. Members of the Chicago Medical Society and their wives are invited. Checks ($5) should be sent to Mr. Moise Dreyfus, 1151 First National Bank Building, before October 26. Dr. Frank Billings is chairman of the memorial committee.

Society News.—Dr. Anton J. Carlson, professor of physiology, University of Chicago, will give the first Harrington lectures at the University of Buffalo, November 15-16, on "Function of the Stomach in Health and Disease."——Among others, Dr. Frederic E. B. Foley, St. Paul, will address the Chicago Urological Society, October 25, at 185 North Wabash Avenue, on "Cystoscopic Excision of the Prostate."——The Institute of Medicine and the Society of Internal Medicine of Chicago will hold a joint meeting at the City Club, October 26, to which members of the Chicago Medical Society and their friends are invited. Oscar Riddle, Ph.D., of the Carnegie Foundation will speak on "Interrelations of Sexuality, Reproduction and Internal Secretions."——The Chicago Gynecological Society was addressed by Dr. Arthur J. Cramp, director, Bureau of Investigation, American Medical Association, at the Medical and Dental Arts Club, October 19, on "Quackery in Gynecology," and by Judge Henry Horner of the probate court,

George E. Fosberg Sentenced to Penitentiary.—Chicago papers, October 12, reported that Dr. George E. Fosberg, alias Charles E. Fosberg, who is credited with having swindled banks to the tune of half a million dollars, was sentenced to the penitentiary for a term of from one to five years. He entered a plea of guilty several weeks ago, and while at liberty pending the outcome of a motion for probation, is reported to have engaged in a new scheme—that of selling stock in a New Mexico orange grove. Fosberg's name has appeared in Chicago newspapers over a period of years in various unsavory connections. His name appeared in 1916-1917 in connection with an abortion case; in 1918 he was called before the department of registration and education and confronted with what was alleged to be evidence to show that he had performed between two and three hundred abortions; in 1925 he appeared in connection with the notorious Shepherd case and testified that Shepherd had consulted him as to ways of obtaining and administering typhoid bacilli and of so poisoning an individual that no postmortem trace of murder could be discovered; in

1925, also, Fosberg was "director" of the "patent medicine" concern that exploited "Liquor Rheumatica"; in 1926 the Chicago Medical Society dropped him from membership. In the same year Chicago papers reported that Fosberg had been arrested with other members of an alleged gang, charged with widespread stock swindles. To this, apparently, Fosberg pleaded guilty and, a few days later, the papers reported that he had been rearrested on two additional charges of conspiracy to defraud two banks.

IOWA

Daughter Sues Pathologists.—A suit asking $25,000 damages was filed, October 10, against three members of the staff of the State University of Iowa College of Medicine, Iowa City, by the daughter of a patient who died at the University Hospital, September 15. The complainant alleges that an autopsy was performed on the body of her father without her knowledge or consent, and that some internal organs were removed.

MARYLAND

New Buildings for Baltimore City Hospitals.—The Baltimore Municipal Architectural Commission has decided to carry out the original plan for the city hospitals and has appointed an architect for the new group of buildings to be erected. The expansion of the Sydenham group of city hospitals on Harford Road will be carried out about as planned by Dr. C. Hampson Jones, commissioner of health; the new buildings at the Baltimore City Hospitals with ward A as a base will include a psychopathic hospital, a tuberculosis hospital, an administration building and a nurses' home. Some of the present buildings, especially the main structure and ward A, will remain. The frame buildings and the psychopathic units will be torn down.

Society News.—The Baltimore City Medical Society will be the guest of the Medical Society of the District of Columbia, November 2. Among others, the Baltimore City Medical Society was addressed, October 19, by Dr. Charles D. Wainwright, Jr., on "A Study of Malta Fever in the United States" and by Dr. Edward H. Richardson on "A Simplified Technic for Abdominal Panhysterectomy."——Among others, Dr. Harry E. Peterman addressed the Baltimore City Medical Society, October 5, on "Ophthalmic Aids in General Diagnosis," and Dr. Harold E. Wright on "Roentgen-Ray in Diagnosing Diseases of the Esophagus."——Dr. Howard E. Ashbury gave an illustrated talk on "Recurrent Massive Collapse of the Lung Due to a Benign Intrabronchial Tumor" before the West Baltimore Medical Association, October 16.

Personal.—Dr. Christopher Johnston, who has been assistant resident physician at the Johns Hopkins Hospital, has accepted a position as assistant resident physician at the Rockefeller Institute.——Dr. John W. Williams, professor of obstetrics, Johns Hopkins University School of Medicine, Baltimore, was guest of honor at a banquet at the Arlington Club, Portland, July 25.——Harry J. Deuel, Jr., Ph.D., assistant professor of physiology, Cornell University Medical College, New York, has been appointed head of the department of physiology at the University of Maryland School of Medicine.——Dr. William H. Welch, Baltimore, has returned after nearly a year and a half spent in Europe investigating and purchasing books for the new medical library at Johns Hopkins University which bears his name.——Dr. Frederick I. Wertheimer, associate in psychiatry, Henry Phipps Psychiatric Clinic, Johns Hopkins Hospital, Baltimore, announces that on the occasion of his naturalization he has changed his name to Dr. Wertham.——Clarence E. Ferree, Ph.D., and his wife, Gertrude Rand, Ph.D., from Bryn Mawr College, have taken up their new work in the research department of the Wilmer Eye Institute. Dr. Ferree will be director of the laboratory of physiologic optics. Dr. Rand will be associate professor of research ophthalmology. They are said to be the inventors of a perimeter which bears their name, a pupillometer and other ophthalmic instruments.

MASSACHUSETTS

A Parapet of Marble.—Along the court of the Medical School of Harvard University, Boston, was dedicated, October 11, a parapet of marble to the memory of four members of the Harvard Medical School unit who lost their lives in an air raid in France, Sept. 4, 1917. Among those at the dedication were Surg. Gen. Merritte W. Ireland and Gen. Clarence Edwards. Dr. Harvey Cushing, who gave the address, said that thanks were due to the authorities of Harvard University and the medical school for permission to place the memorial and for its architectural beauty to Charles A. Coolidge and Henry R. Shepley. Behind the memorial, Dr. Cushing said, stands the building "in which many of you on that May afternoon . . . threw over your accustomed jobs, eager to enlist at whatever cost. Before it stretches the avenue that bears the name of Louis Pasteur in whose France we were destined to do our bit. . . . Cut in one of the tablets before you are the names of four whom we saw buried with military honors in that vast harvest of crosses on the dunes of Etaples." The Harvard unit before departure for France was presented with a company fund to which Bostonians had generously contributed. The fund was conserved in France as far as possible and it was agreed that the unexpended balance might be drawn on for temporary loans to needy members of the disbanded unit or to those seeking educational advantages. It was further agreed, according to the Boston *Transcript*, that when loans had been paid in, the fund might be used for the erection of a suitable memorial. This marble wall, Dr. Cushing said, might be taken as a peace time symbol of those "bags of sand now rotted away and plowed back into the soil of Flanders and France, but which once, with wire before and a ditch behind, wound their sinuously parallel ways from the channel to Switzerland."

MICHIGAN

Personal.—Howard D. Lightbody, associate professor of physiologic chemistry, Michigan State College of Agriculture and Applied Science, East Lansing, has been appointed director of the John C. Oliver Memorial Research Foundation, recently established at the St. Margaret Memorial Hospital, Pittsburgh.——Dr. Walter T. Parker has been appointed superintendent of the Memorial Hospital, Owosso.

Society News.—The medical section of the Wayne County Medical Society, Detroit, was addressed, October 9, on "Sickle Cell Anemia" by Dr. Ezra V. Hahn, Indianapolis.——Dr. Edward Kyle Simpson, Pontiac, addressed the Oakland County Medical Society, September 21, on "Medical Practice in China."——The Oakland County Bar Association, Pontiac, was host to the Oakland County Medical Society at golf and a dinner at the Aviation Country Club, Green Lake, October 3.

Bacteriologists Meet at East Lansing.—Bacteriologists, serologists, immunologists, pathologists and microscopists will meet at East Lansing, at 2 p. m., November 19, to discuss the feasibility of a new organization to supplement the associations already existent for these specialties. All persons interested are invited. There will be a symposium on microscopic dissociation, a business meeting and a dinner, all preceding a lecture in the evening by Prof. F. d'Herelle of Yale University School of Medicine, New Haven, Conn., the discoverer of the bacteriophage. Further information may be had from Walter L. Mallmann, department of bacteriology, Michigan State College, East Lansing.

Lansing Honors Dr. Kahn.—About 150 civic, social, religious and professional leaders attended a community banquet in Lansing, October 5, to honor Reuben L. Kahn, D.Sc., who did most of the work of the discovery of the Kahn test while serologist in the state laboratories at Lansing. Mayor Troyer introduced the toastmaster, Clarence E. Bement; the speakers were Dr. Henry S. Bartholomew, Mr. George N. Fuller, Dr. Don M. Griswold, Prof. Ward Giltner and Judge Carr. Dr. Kahn recently returned from a serologic conference at Copenhagen to which he was invited by the health committee of the League of Nations to demonstrate, together with the authors of other precipitation tests, his test for the diagnosis of syphilis. Dr. Kahn leaves Lansing for Ann Arbor, where he has been appointed director of laboratories at the University Hospital and assistant professor of clinical bacteriology and serology in the medical school.

MINNESOTA

Dedication of Clinic Building and Carillon.—At the dedication of the new nineteen-story building of the Mayo Clinic, Rochester, September 16, there was dedicated also a twenty-three bell carillon in the tower. The occasion was marked by addresses by members of the staff. Dr. Charles Mayo said that the carillon was the fruition of a plan that had long been in mind and was intended to serve as "an oft repeated reminder of our obligations to the American soldiers who have never fought in a war of conquest and whose battles, both on land and sea, have contributed to the freedom of man." Interesting remarks about carillons were made by Dr. Louis B. Wilson. Before 1922 there were only three in this country. According to the New York *Herald-Tribune*, there are now twenty-four, and plans have been announced for four more. Most of the 200 carillons in the world are in Belgium, Holland, France and Germany. The carillonneur of the day at the

Rochester dedication was Mr. Price of Ottawa, Canada, who said that for quality of tone these bells were the equal of any. Dr. William Mayo, in addressing the annual meeting of resident and ex-resident physicians, said:

In 1863 Dr. William Worrell Mayo, representing the war department of the United States government, came to Rochester as medical provost marshal of the draft. He took up as a homestead the ground now occupied by the clinic, and it was here that he had his offices and his home. My brother was born here, and I lived here from the time I was an infant in arms.

William Worrell Mayo held the belief that it was the duty of the medical practitioner to care for the patient without regard to his social or financial status, race or creed. In all the years since that early time no man has ever been refused treatment because of lack of ability on his part to pay; no note of hand or other evidence of debt has ever been taken; no one has ever been permitted to mortgage a home to pay his clinic bill, and no person has ever been compelled to pay by suit at law.

It speaks well for mankind that so high a percentage of persons have of their own free will done what they could to meet their obligations to the clinic. It has been the practice of the clinic to look on all moneys that have been received over and above a reasonable return to the workers as a trust, which through endowments is to be expended for the best interests of the sick; first, in better care of the patients themselves; second, in research which will prevent or alleviate human ailments, and third, in higher medical education.

MISSOURI

Personal.—Dr. Hardy A. Kemp has resigned from the staff of the Missouri State Sanatorium for the Treatment of Incipient Tuberculosis, Mount Vernon, to become associate professor of bacteriology at Baylor University College of Medicine, Dallas, Texas.——Dr. Jonas C. Lyter, St. Louis, was guest of honor at a dinner given by the superintendent of the state hospital, Dr. Charles E. Trovillion, at Anna, Ill., September 13.——Dr. John B. Gordon, Bunker, recently celebrated his fifty-sixth year in the practice of medicine.——Dr. Frank B. Fuson, Jefferson City, has resigned as health supervisor for the state eleemosynary institutions to become superintendent of the Evergreen Place Hospital and Sanatorium, Leavenworth, Kan.

Political Pressure Fails—Horton Loses License.—The Missouri Supreme Court, October 2, unanimously sustained the order of the Missouri State Board of Health revoking the license of Ray B. Horton of Kansas City and Purdy, Mo. Horton was one of the figures in the medical license scandal in Missouri. The decision closes a case in which political pressure and legal delay have for three years been utilized in an effort to prevent the board of health from pressing the Horton charges. In his application for an examination for medical licensure, Horton fraudulently claimed to be a graduate of Purdy High School and to have attended the notorious St. Louis College of Physicians and Surgeons for three years. Horton was never graduated by Purdy High School. Three students in a low grade Kansas City medical college testified that they paid Horton amounts ranging from $500 to $1,000, on the understanding that he could influence the board to give them permission to take the examination. When Horton's license was first revoked by the board, he carried his case to the St. Louis circuit court, where Judge Robert Hall overturned the board's decision and ordered Horton's license restored to him. Delay after delay was forced by Horton, and while the case was actually pending before the supreme court, Dr. James Stewart, Jefferson City, secretary of the state board of health, disclosed that political pressure had been brought to bear to have the case dropped or postponed indefinitely. Thereupon, the board adopted a resolution to press the case and asked the court to advance its appeal on the docket. The supreme court in its decision held that the board of health clearly had jurisdiction to revoke Horton's license, and declared that such powers as had been conferred on it, to enable the board effectively to safeguard the public health, should receive a liberal construction by the courts.

Society News.—Dr. Edwin Schisler addressed the St. Louis Medical Society, September 18, on "Diagnosis of Diaphragmatic Hernia" with report of case, and Dr. Ellis Fischel on "Carcinoma of the Cervical Esophagus" with patient and lantern slide demonstration. Drs. Joseph Hoy Sanford and Howard A. Rusk presented a case report of "Perinephritic Abscess with Rupture Into Lung with Recovery."——The state board of health will meet for the examination of applicants to practice medicine at the Jefferson Hotel, St. Louis, October 23-25.——Dr. George Leonard Harrington addressed the Jackson County Medical Society, Kansas City, September 18, on "Psychotherapy" and Dr. Benjamin L. Myers on "The Centennial of Lord Lister."——The Bates and Vernon-Cedar county medical societies held a joint meeting at Butler, September 6; Dr. Samuel H. Snider, Kansas City, talked on "Tuberculosis with Special Reference to Treatment by Pneumothorax," and Dr. Everett R. Deweese, Kansas City, on "Practical X-Ray Findings," illustrated with plates.——The Buchanan County Medical Society was addressed, September 19, by Dr. Caryl A. Potter, St. Joseph, on "Further Observations in the Treatment of Duodenal and Fecal Fistulas."——The Nodaway County Medical Society held a dinner meeting at Maryville, September 14, which was addressed by the secretary of the state medical society, Dr. Edward J. Goodwin, St. Louis; the scientific session was addressed by Dr. James E. Stowers, Kansas City, on "Acute Salpingitis and Pelvic Cellulitis," and by Dr. Evan S. Connell, Kansas City, on "Ear Complications in the Exanthemas." Dr. Goodwin also addressed this session, which was said to be the first time in many years that a state officer had officially visited this society.——Dr. Harry M. Gilkey, Kansas City, spoke on "Problems in Pediatric Practice," illustrated with lantern slides, before the Saline County Medical Society, Marshall, September 12, and Dr. Charles C. Conover, Kansas City, on "The Human Heart in Infections."

NEBRASKA

Society News.—Dr. Edward S. Blaine, Chicago, addressed the Omaha-Douglas County Medical Society, September 24, on "Value of a Case History in Roentgen-Ray Interpretation," and Dr. Frank S. Bissel, Minneapolis, on "Cooperative Diagnosis from the Standpoint of the Roentgenologist."——Twenty-five members attended the quarterly meeting of the Cedar, Dakota, Dixon, Thurston and Wayne Counties Medical Society in Wakefield; Dr. Jesse B. Naftzger, Sioux City, Iowa, discussed "Nasal Sinus and Middle Ear Infections in Children," and Dr. Willis H. Taylor, Omaha, mouth disease.——At the September meeting of the Madison Five Counties Medical Society, Norfolk, Drs. Charles F. and Louis E. Moon, Omaha, spoke on "Use of the Kielland Forceps" and rectal diseases, respectively.

NEW MEXICO

Change of Date of Southwest Meeting.—The Medical and Surgical Association of the Southwest will hold its annual meeting at Albuquerque, November 8-11. The speakers announced are Drs. John H. Musser, New Orleans, internal medicine; Karl A. Menninger, Topeka, Kan., neuropsychiatry; William Engelbach, St. Louis, endocrinology; Leonard Freeman, Denver, surgery; James W. Kennedy, Philadelphia, gynecology; Jay A. Myers, Minneapolis, internal medicine; John W. Shuman, Los Angeles, bronchoscopy, and Henry J. Ullmann, Santa Barbara, Calif., radiology. These are all to be practical clinical talks and some of them are to be accompanied by clinics.

NEW YORK

Society News.—The Jefferson County Medical Society, Watertown, was addressed, September 13, by Dr. Carl R. Comstock, Saratoga Springs, on "Rôle of the Health Resort in Treatment of Cardiac Cases," and Dr. Page E. Thornhill, Watertown, showed motion pictures illustrating prenatal examinations. The society spent the afternoon at golf.——The Rensselaer County Medical Society was entertained at the Pawling Sanatorium, Wynantskill, September 18. More than 100 attended. The board of managers of the sanatorium recently requested the society to name members qualified in the specialties to serve on the consulting staff and suggested that next year the personnel of the staffs be changed so that every physician qualified in time will have an opportunity to serve on a staff.

New York City

Typhoid in Greenwich Village.—An owner of a candy shop who dispensed ice cream cones to children and others in the Greenwich Village district is reported responsible in part, at least, for an outbreak of typhoid that amounted to about thirty cases, October 7. The candy shop owner was said to be a typhoid carrier, and the same one who caused the Park Slope outbreak in 1914 in Brooklyn. He has been placed under observation in a hospital, and all food that he had handled at the store was destroyed. Other steps have been taken to stop the outbreak.

Lectures for General Practitioners.—The New York Academy of Medicine, Fifth Avenue and One Hundred and Third Street, announces its third series of lectures for the general practitioner to be held Friday afternoons, at 4:30, beginning November 2, and continuing until April 12. The profession generally is invited. The speakers during November will be:

November 2, Dr. Jesse G. M. Bullowa, Harlem Hospital, "Serum Treatment and Its Evaluation in Lobar Pneumonia."
November 9, Dr. John E. MacKenty, Manhattan Eye, Ear and Throat Hospital, "Carcinoma of the Larynx."
November 16, Dr. John L. Kantor, Montefiore Hospital, "Common Affections of the Colon: Their Origin and Management."
November 23, Dr. Alfred Friedlander, professor of medicine, University of Cincinnati College of Medicine, "Clinical Types of Hypotension."

Society News.—The Rockefeller Institute for Medical Research has filed plans with the city for the erection of a four story laboratory to cost about $250,000.——The New York Women's Medical Association has purchased a site at One Hundred and Seventh Street and Central Park West for the erection of a 200 bed hospital.——The local committee of the American Society for the Control of Cancer will give demonstrations and clinics bearing on the diagnosis and treatment of cancer in hospitals throughout the city, November 8-15.——The first lecture of the current practical series of the Kings County Medical Society was on "Surgical Complications of Pregnancy," October 5, by Dr. John O. Polak.——Dr. Oswald S. Lowsley addressed the Royal Medical Society of England, October 4, on "Surgical Intervention in Enlargement of the Prostate," illustrated with motion pictures, and conducted a clinic for the society at St. Paul's Hospital, London.——The extension division of Columbia University and the school of medicine offers an eight weeks' course in chronic diseases for graduates in medicine, beginning October 22 and a second course beginning January 28. They will be given at the Montefiore Hospital for Chronic Diseases. A deposit of $10 is necessary to make a reservation. Correspondence should be addressed to the dean of the school of medicine, 630 West One Hundred and Sixty-Eighth Street, New York.——The New York Psychoanalytic Society has established a trust fund, which, on October 1, amounted to about $7,500. The income will be used to provide treatment for needy persons having nervous disorders and to assist physicians in obtaining adequate psychoanalytic training.——Drs. Russell L. Cecil addressed the Medical Society of the County of New York, October 22, on "Therapeutic Value of Refined Antipneumococcus Serum"; Alvan L. Barach, "Ogygen Tent Therapy in Pneumonia," and Morris K. Smith, and Paul C. Morton, "Postoperative Pneumonia."——The gram of radium recently purchased by the city has been delivered to the radiation therapy department of Bellevue Hospital and the installation for the new roentgen therapy has been completed.——Dr. David Riesman, University of Pennsylvania, addressed the Kings County Medical Society, October 16, on "Chronic Myocardial Disease," and Dr. Robert C. Coffey, Portland, Ore., on "Ureteral Transplantation."

Dedication of New York's Great Medical Center.—The new $25,000,000 medical center comprising about eleven institutions at Broadway and One Hundred and Sixty-Eighth Street was dedicated, October 12. The outdoor ceremony was attended by about 3,000 people. William Barclay Parsons, the chairman of the board of trustees of Columbia University and of the Joint Administrative Board, stated that the idea of the joint enterprise first reached receptive ears eighteen years ago. The endless details of so vast an undertaking were gradually solved and great sums of money were finally raised. The fruits of those years of cooperative effort now stand forth most prominently on the bank of the Hudson. Still other institutions may be invited to join the group as further needs develop, so that, as the chairman said, this center shall increasingly represent the ideals and achievement worthy of the city, state and nation. The honor of giving the dedicatory address was accorded Dr. Samuel W. Lambert, formerly dean of the medical school. He said that the College of Physicians and Surgeons was founded under the auspices of the Medical Society of the County of New York in 1807 to improve methods of teaching medicine. It was then a rival of the medical department of Columbia University, whose medical faculty it absorbed in 1813. Then for seventy-five years Columbia had no medical department. The College of Physicians and Surgeons saw the trend of medical education toward university connections, and was the first great medical school to establish such connection by merging its corporate existence in Columbia. Dr. Lambert said that the soul of the medical school and hospital is the medical clinic and that every specialty is an offshoot and growth from it. The Presbyterian Hospital, founded in 1868 and representing the humanitarian impulses of one of the churches to do its whole duty to the poor, is a direct descendent of the sanatoriums of Greece which developed from the temples of Aesculapius and of the hospitals begun by the Crusaders of the eleventh century. The College of Physicians and Surgeons has built up its own traditions through its pioneer physiologist Dalton, its clinician and pathologist Delafield, its surgeons Parker, Sands and Bull, its critical scientist, Prudden, and its anatomists Sabine and Huntington. Dr. Lambert emphasized that it should never be forgotten that this is a school of medicine, and that its scientific departments should be in the hands of chiefs who are first doctors of medicine and then scientists. The science of medicine, he said, should never take precedence over and exclude the art of medicine.

NORTH CAROLINA

Record District Meeting.—The largest attendance in the history of the Ninth District Medical Society turned out, September 27, for the meeting at Statesville; among those present were the president and secretary of the North Carolina State Medical Society, the dean of Duke University Medical School, Durham, and several former presidents of the state medical society. Those present numbered 256; this society has grown until it is second only to the state medical society. Dr. Roy C. Tatum, Statesville, was elected president for the ensuing year. Among the speakers were Drs. Louis H. Clerf, Philadelphia, on "Peroral Endoscopy as an Aid to the General Practitioner"; Douglas P. Murphy, Philadelphia, "Health of Children Born After Pelvic Radium and X-Ray Therapy"; James K. Hall, Richmond, Va., "Fear, Man's Worst Enemy"; Frank H. Richardson, Brooklyn, "Breast Feeding," and Major James M. Troutt, medical corps, U. S. Army, "Differential Diagnosis of Ovarian Cystoma." At the dinner meeting short talks were made by Drs. Thurman D. Kitchin, Wake Forest, Charles O'H. Laughinghouse, Raleigh, Wilburt C. Davison, Durham, and Louis G. Beall, Black Mountain.

OKLAHOMA

Society News.—The state health department recently announced that 300,000 capsules of quinine have been distributed in Bryan, Choctaw and Pushmataha counties as a part of the campaign to eradicate widespread malaria infection.——The Oklahoma County Medical Society was addressed, September 8, among others, by Dr. R. M. Howard, Oklahoma City, on "Surgical Goiter," and by Dr. Green K. Dickson, Oklahoma City, on "Goiter Heart."——Dr. William T. Tilly, Muskogee, has closed the hospital which he has operated for about sixteen years; he will continue in practice.——Dr. Jabez N. Jackson, Kansas City, Mo., recently President of the American Medical Association, will give the dedicatory address at the opening of the new hospital of the University of Oklahoma, Oklahoma City, November 2.

PENNSYLVANIA

Typhoid at Stoyestown.—The outbreak of seventeen cases of typhoid at Stoyestown late in September is reported to have been due to a contaminated water supply caused by a highway construction gang pumping contaminated water into the Stoyestown water line. The supply to only a part of the town was affected.

Personal.—Dr. Russell H. Person, Athens, has been appointed coroner of Bradford County.——Dr. George W. Stoler, Lancaster, has been appointed chief resident physician at the Lying-In Hospital, New York.——Dr. Edward Lyon, Jr., Williamsport, has been appointed a member of the pension board in that district, filling the vacancy caused by the death of Dr. William E. Glosser.

Hospital News.—The Corrigan Maternity Hospital at Hazelton was recently opened to the public.——The public has subscribed $400,000 for a new hospital building at Bloomsburg for the construction of which bids were opened, August 8.——The new 150 bed Connellsville State Hospital was opened, August 20; it was built jointly by the state and community, the citizens of Connellsville subscribing $250,000 toward the cost.

The Pennsylvania Medical Journal.—The plan undertaken by the *Pennsylvania Medical Journal* of expanding into a larger sectional publication, under the name of the *Atlantic Medical Journal*, came to an end with the October issue, and the publication has resumed its former name. In making the announcement, the editor says that the *Pennsylvania Medical Journal* was founded in 1886 as the *Pennsylvania Medical Review* under the editorship of Dr. X. O. Werder. It was changed to the *Pennsylvania Medical Journal* in 1897, becoming the first state medical journal in America. The late Dr. Cyrus L. Stevens, Athens, became editor in 1904, and, at his request, the state medical society took over the journal in 1920. The office was then transferred to Harrisburg, and Dr. Frederick L. Van Sickle was made editor. The name was changed in 1923 to the *Atlantic Medical Journal* and the Medical Society of Delaware joined in its publication. The editor, Dr. Frank C. Hammond, Philadelphia, says the present name is dear to many of the members and is dignified by long years of service to the profession of Pennsylvania.

Philadelphia

Society News.—The Philadelphia County Medical Society held a symposium, October 10, on the relation of animal experimentation to medical progress, which was open to the public.

——The Pathological Society of Philadelphia was addressed, October 11, by M. B. Rose on "Relation of Vitamin B to Infection and Immunity, with Special Reference to B. Welchii." ——The Philadelphia Roentgen Ray Society will meet jointly with the Philadelphia County Medical Society, October 24; Drs. Willis F. Manges will discuss "Cholecystography"; David R. Bowen, "Acute Massive Collapse of the Lung"; George E. Pfahler, "Results from Radiation Therapy in Malignant Disease," and Gustavus C. Bird, "Roentgenologic Examination of the Appendix."——The Northern Medical Association of Philadelphia held a symposium on physical diagnosis, October 15; the speakers were Drs. John F. Sinclair, Mitchell Bernstein, William Bates and Gershon Ginsburg.

TENNESSEE

Health at Nashville.—Telegraphic reports to the U. S. Department of Commerce from sixty-nine cities with a total population of about 31 million, for the week ending October 6, indicate that the highest mortality rate (20.4) was for Nashville, and that the mortality rate for the group of cities as a whole was 12.2. The mortality rate for Nashville for the corresponding week last year was 12.5, and for the group of cities, 11.1.

Society News.—Dr. William C. Chaney, Memphis, gave an illustrated lecture on "Diagnosis of Goiter" before the Dyer County Medical Society, August 2.——At the annual meeting of the Gibson County Medical Society, August 21, Dr. Jarrell Penn discussed "Management of Congenital Club Feet," illustrated by motion pictures; Dr. Henry G. Rudner, "Vincent's Disease," and Dr. Joseph A. Crisler, Memphis, "Goiter."——Dr. Seale Harris, Birmingham, Ala., addressed the Knox County Medical Society at Whittle Springs, August 7, on "Rôle of Vitamins in the Etiology and Cure of Gastric and Duodenal Ulcers."——The Montgomery County Medical Society met at Dunbar Cave, August 16; Drs. James B. McElroy and Willis C. Campbell, both of Memphis, discussed "Hypertension" and "Prevention of Deformity of Bones," respectively.——At the August 23 meeting of the Tri-County Medical Society (Roane, Monroe and Loudon), among others, Dr. Paul Padget, Lenoir City, discussed "Clinical Manifestations of Senility"; Dr. Joseph J. Waller, Oliver Springs, "Puerperal Eclampsia"; Dr. Eugene L. Bishop, Nashville, "Program and Policies of the State Department," and Dr. Henry J. Hayes, Memphis, some causes of paralytic manifestations, their onset and course. ——The White County Medical Society was addressed, August 9, at Bon Air by Dr. Wesley J. Breeding, Nashville, of the state department of health on "History of Medicine on Bon Air Mountain." ——Knox County Medical Society held an all-day clinical session at Whittle Springs, September 25. The clinicians were Tennessee physicians with the exception of Drs. Albert Graeme Mitchell, Cincinnati, and James S. McLester, Birmingham, Ala. Dr. Robert B. Wood, Knoxville, presided. Dr. Ernest R. Zemp, Knoxville, was in charge of the banquet, at which, it had been announced, there would be no orators.——The Hamblen County Medical Society was entertained at the home of Dr. and Mrs. Charles T. Carroll, Jr., Morristown, recently, at a watermelon feast to celebrate the three hundredth anniversary of the discovery of the circulation of the blood by Harvey.——The state department of health has established a branch laboratory at Johnson City; there are branch laboratories also at Memphis, Chattanooga and Knoxville. The department at the request of the Five County Medical Society held a chest clinic before the members at Hohenwald, August 28; Dr. Jesse B. Naive of the Davidson County Tuberculosis Hospital acted as clinician in charge.

TEXAS

Society News.—The Dallas County Medical Society was addressed, October 11, by Dr. Otto H. Schwarz, professor of obstetrics, Washington University Medical School, St. Louis, on eclampsia, and by Dr. Reginald B. Leach, Paris, Texas, on "Science in Therapeutics."——Dr. LeRoy B. Duggan, Belton, has been made assistant director of health of the Dallas public schools, succeeding Dr. Lawrence E. Hamilton, resigned.

Typhoid Near Dallas.—There had been seven deaths from typhoid in August in a settlement of Mexican families on the outskirts of Dallas, according to the Dallas *News*, and about twenty-five other persons were suspected of having the disease at the time of the report. The city health officer, Dr. Manton M. Carrick, had the most seriously ill taken to hospitals. Surface wells were said to have been the cause of the outbreak. City and county health officers were cooperating to stamp out the source of infection.

Texas Enlarges Its Laboratories.—The opening of the new year at the University of Texas School of Medicine, Galveston, is marked by the equipment of a new laboratory of tropical medicine and additions to the children's hospital. All medical school laboratories are being enlarged to meet the demands of an increased enrolment of students and the John Sealy Hospital is constructing a new power plant at a cost of $400,000. Among the additions to the faculty are Dr. Edward Randall, Jr., as professor of materia medica and therapeutics; John G. Sinclair, professor of histology and embryology, and Dr. Paul Brindley, acting director of the department of pathology. Changes in the faculty at Baylor University College of Medicine, Dallas, include Dr. Maurice L. Richardson, formerly of Western Reserve University School of Medicine, Cleveland, who becomes professor of pathology, and Dr. Harold E. Smith, assistant pathologist.

GENERAL

Board Rules Traveling Expenses Are Deductible.—The Board of Tax Appeals reversed a decision of the Commissioner of Internal Revenue, October 2, in which he held that amounts expended by a physician for railroad fare, hotel accommodations and meals in attending meetings of medical societies were not deductible in computing physicians' federal income taxes. The board held that expenses so incurred were deductible under the law as ordinary and necessary expenses. The appeal was brought by Dr. Cecil M. Jack, Decatur, Ill. In reversing the action of the commissioner, the board pointed out that it had held that similar expenses were deductible in the cases of a minister and a chemist. The commissioner relied on a decision of the board in which it held that the expenses of Dr. Everett S. Lain, Oklahoma City, incurred in attending medical meetings, were not deductible. The board pointed out that it was necessary to affirm the commissioner's denial of the deductibility of Dr. Lain's expenses because of lack of proof of the amounts expended. Unless an appeal to the courts is made within six months, this decision becomes final.

Southern Medical Association Meeting at Asheville.—The annual meeting of the Southern Medical Association will be at Asheville, N. C., November 12-15, under the presidency of Dr. William R. Bathurst, Little Rock. The first day will be given over to clinics arranged by local members, some of which will be at the government hospital for tuberculosis at Oteen. The general clinics will be held Tuesday by representative men from various parts of the South. The seventeen sections of the association will hold their meetings Wednesday and Thursday. The social program comprises a reception, alumni banquets, golf tournament, trap shooting and special entertainment for the ladies. There are many points of interest in Asheville, including a permanent game preserve on the slopes of Mount Pisgah, where there are deer, elk and wild turkeys, but no hunting is allowed. There are state game refuges, and streams stocked with bass and trout and national forests near Asheville which are open to the public at all times. The Cherokee Indians live on a reservation at the foot of the Great Smoky Mountains. The chairman of the committee on hotels is Dr. F. Webb Griffith, Haywood Building, Asheville.

Report on Nurse Training Schools.—The bureau of education of the U. S. Department of the Interior received reports from 1,797 nurse training schools in 1927, which was an increase of forty-two over the number received in 1920 and of 288 over the number received in 1915. General hospitals, the report states, maintain 1,722 of these schools and hospitals for the insane maintain the other seventy-five. The total number of nurse training pupils reported for 1927 was 77,768, an increase of 41.5 per cent over 1920; among them were 549 male pupils. The number of graduates of nurse training courses reported in 1927 was 18,623, an increase of 24.3 per cent over the number for 1920. In only fifty-eight of the 1,797 schools is there a charge for tuition, and only fourteen of the fifty-eight charged tuition for the second and third years. The amount of tuition for the full course ranges from $25 to $325. Thirty-nine of these schools granted allowances to pupils which range for the training period from $80 to $1,908. The average educational requirement for entrance to schools in general hospitals in 1920 was a little less than tenth grade work, but by 1927 it had increased to about one half through the tenth grade. In 1918 nearly one half of the schools in general hospitals required ten hours' work a day, but this had decreased by 1927, when more than one half required more than eight hours' work a day. The hospitals with which these 1,797 training schools for nurses are connected have a bed capacity of 359,077, and an average daily number of patients of 276,194. This is an average bed capacity of about 200 per hospital, an average of 154 daily patients per hospital, and an average of forty-three nurse training pupils per school.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Sept. 22, 1928.

The British Association for the Advancement of Science

At the annual meeting of the British Association for the Advancement of Science, which was held at Glasgow, many of the papers read were, as usual, of special interest to physicians.

THE MYSTERY OF LIFE

Prof. F. G. Donnan, the chemist, said that it is probably at least a thousand million years since the earth acquired a solid crust of rock. During that period living beings, plants and animals have appeared. Observing the apparent freedom, spontaneity, and indeed waywardness of many forms of life, we are at first lost in amazement. Is this thing we call life some strange and magical intruder, some source of lawless and spontaneous action, some fallen angel from an unknown and inconceivable universe? Are living things subject to the laws of energy that control the phenomena of the inanimate world? Physiologists found that they form no exception to the laws of the conservation of energy. Further, so far as is known they conform to the second law of thermodynamics, restricting the direction of energy transformation. They do not live and act in an environment of perfect physical and chemical equilibrium. It is the nonequilibrium, the free or available energy of the environment, which is the sole source of their life and activity. A steam engine moves and does work because the coal and oxygen are not in equilibrium, just as an animal lives and acts because its food and oxygen are not in equilibrium. As Bayliss has so finely put it, "equilibrium is death." The chief source of life arises from the fact that the cool surface of the earth is constantly bathed in a flood of high temperature light. All living things live and act by utilizing some form of nonequilibrium or free energy in their environment. A living being is not a magical source of free energy or spontaneous action. Its life and activity are ruled and controlled by the amount and nature of the free energy, the physical or chemical nonequilibrium, in its immediate environment, and it lives and acts by virtue of this. The cells of a human brain continue to act because the blood stream brings to them chemical free energy in the form of sugar and oxygen. Stop the stream for a second and consciousness vanishes. Without that sugar and oxygen, then, there could be no thought, no sweet sonnets of a Shakespeare, no joy and no sorrow. To say, however, that the tide of life ebbs and flows within the limits fixed by the laws of energy, and that living beings are in this respect no higher and no lower than the dead things around them is not to resolve the mystery. Step by step this is being unraveled by general physiology, which, in its application of physics and chemistry to the operations of cells, is the fundamental science of life.

In England, work is being done by three of the greatest living exponents of general physiology, namely Barcroft, Hill and Hopkins, while in America the great work of Jacques Loeb is carried on by men of the high caliber of Lawrence Henderson, Osterhout and Van Slyke. In Germany there are such great names as Meyerhof, Warburg, Bechhold and Hober. What are these men attempting? Just what Claude Bernard set out in his program, namely, by a patient, exact and quantitative application of the facts and laws of physics and chemistry to the elementary phenomena of life to arrive gradually at a synthesis and understanding of the whole. The chemistry and energy changes of the muscle have been discovered recently by Meyerhof in Germany, and by A. V. Hill and Hopkins in England. When the muscle tissue contracts it derives the necessary free energy, not from oxidation, which is not quick enough, but from the rapid exothermic conversion of glycogen into lactic acid. When the fatigued muscle recovers, it recharges its store of free energy; that is to say, by oxidizing some of the carbohydrate, it reconverts the lactic acid into glycogen. Thus, in the recovery stage, we have the coupled reactions of exothermic oxidation and endothermic conversion of lactic acid into glycogen. Everything proceeds according to the laws of physics and chemistry.

The story of this mode of action and recovery of the muscle cells forms one of the most fascinating chapters of general physiology. Here we see one of the elementary phenomena of life already to a great extent analyzed and elucidated. Two of the most important elementary phenomena of many forms of life, namely, respiration and the exchanges of the red blood cells, have been described by exact mathematical equations. The story of this blood equilibrium we owe to the labor of many distinguished physiologists, but chiefly to Lawrence Henderson and Van Slyke in America, and to A. V. Hill and Barcroft in England. Thus the elementary phenomena of life are deterministic, that is to say, events compensate or succeed each other just as in the physicochemical world of inanimate things. In seeking to discover what is contained in the membrane of the living cell, we approach the inner citadel of the mystery of life. The living cell contains a system known as protoplasm, though no one can define what protoplasm is. One of the fundamental components of this system is the class of chemical substance known as protein, and each type of cell in each species of organism contains one or more proteins peculiar to it. There must exist some curious inner structure in which the protein molecules are marshaled and arrayed as long mobile chains or columns. The molecular army within the cell is ready for quick and organized action, and is in a state, during life, of constant activity. Oxidation assimilation and the rejection of waste products are always going on. The living cell is constantly exchanging energy and materials with its environment. The apparently stationary equilibrium is in reality a kinetic or dynamic equilibrium. But there is a great mystery. Deprive the motor car of gasoline or of oxygen and the engine stops, but it does not begin at once to go to pieces. Deprive the living cell of oxygen or food and it dies and begins at once to go to pieces. The autolytic enzymes begin to hydrolyze and break up the dead protoplasm. What is cellular death? The atoms and the molecules and the ions are still there. Meyerhof has shown that the energy content of living protein is no greater than that of dead protein. Has some ghostly entelechy or vital impulse escaped unobserved? Here, at the very gate between life and death, the English physiologist A. V. Hill is on the eve of an astounding discovery, if indeed he has not already made it. It appears from his work on nonmedullated nerve cells and on muscle that the organized structure of these cells is a chemodynamic structure which requires oxygen, and therefore oxidation, to preserve it. The organization, the molecular structure, is always tending to run down, to approach biochemical chaos and disorganization. It requires constant oxidation to preserve the peculiar organization or organized molecular structure of life of a living cell. The life machine is therefore totally unlike our ordinary mechanical machines. Its structure and organization are not static but in reality dynamic equilibriums which depend on oxidation for their very existence. The living cell is like a battery which is constantly running down, and which requires constant oxidation to keep it charged. For the first time in the history of science we begin, perhaps as yet a little dimly, to understand the difference between life and death, and therefore the very meaning of life itself. Life is a dynamic molecular organization kept going and preserved by oxygen and oxidation. Death is the natural irreversible breakdown of this structure, warded off only by the structure-preserving action of oxidation.

THE TREND OF MODERN PHYSIOLOGY: THE RESEARCH FALLACY

In his presidental address to the physiologic section, Prof. C. Lovatt Evans said that physiology, using other sciences as its tools and itself reacting powerfully on them, had a great future, but implicit in its very potentialities there is a gloomy side. The rapidly accumulating wealth of detailed knowledge and of special technic demands increased specialization; unless there is a periodic intellectual stocktaking there must inevitably be a loss of perspective and of grasp of great general principles. But how can this stocktaking be done? Can team work ever reach that harmony of action which distinguishes the individual? Any scientific subject is capable of indefinite expansion, and with the biologic sciences it is hard to foresee what the ultimate end of mere expansion can be. How will scientific literature develop? Will there have to be abstracts of abstract journals and reviews of reviews? Will the subdivision of the subject necessitate in the long run the creation of lectureships or professorships to deal, for example, with the special physical chemistry of heterogeneous equilibriums in biologic systems, with intermediary metabolism, with the problems of hemodynamics, or growth, or reproduction? If so, how will the results of their special investigations be brought to common ground if no great unifying principles come to light? Can we expect such unifying principles will appear? If they do not, will the progress of science be brought to an end by the accumulation of its own products? The establishment of special research professorships, however profitable in isolated cases, cannot make good this growing specialization, because it will tend to divorce research and teaching and place the teaching professor on a level of real or apparent inferiority. The idolization of research for the sake of the advancement it brings is another of the dangers which threaten us. If there is one thing worse than "a mediocrity who does no research" it is "a mediocrity who does." There are at present many junior research posts available, but not enough well trained persons to fill them adequately. This is all to the good, provided that those who on trial show no aptitude can be eliminated. As they often cannot, there are in consequence a number of persons who drift from one research scholarship to another, perhaps not aimlessly, but with no better objective than the manufacture of papers designed to justify their employment. The hapless editors of each of the swelling tide of journals are coaxed, hoodwinked, and, if necessary, bullied to insure that these papers see the light of day. In the fulness of time the list of short-time research posts is exhausted, and the young investigator must now either turn to some entirely different occupation or else "subside into a professorial chair" for which, incidentally, he is probably entirely unfitted.

THE ORIGIN OF HUMAN SPEECH

In the anthropologic section Sir Richard Paget defined speech as a combination of two separate arts by which men and animals communicated. The first was phonation, the production of sounds varying to express emotional stages such as fear, anger or pleasure. That was due to the forcing of air through the vocal chords, which thus vibrated like the actual lips of a trumpet player, the pitch and quality of the sound being controlled by the length, thickness and tightness of the cords and the volume depending on the air pressure supplied by the lungs. Just as men expressed their emotions by the varying attitude of their lips, so they might express them unconsciously by the varying attitude of the cords. The second principle was articulation, the variation of the interior shape of the vocal cavities through which the air from the lungs was blown, as a result of movements of the tongue, lips, jaws and other movable parts. These movements or gestures of articulation were only a development of another general animal principle, that of communicating information by pantomimic gesture. He demonstrated some models to indicate how vowels and consonants were formed. He showed that speech could be produced artificially by using the human lips as vocal cords and the human hands as a mouth. How had the art of articulation arisen? He had found the answer from a suggestion made by Darwin that persons cutting with a pair of scissors often moved their jaws sympathetically and that children learning to write often twisted their tongues as their fingers moved, in a ridiculous fashion. Dr. Rae of Honolulu had shown even before that time that at least in Polynesian speech the syllables were the result of mouth gestures which themselves symbolized the succession of ideas to be conveyed, and that the same principle might apply to Aryan speech. Here was the probable origin of human speech. Primitive man would sing, grunt or roar to express his emotions, just as animals did. He would pantomime with his face and limbs to express his ideas to his fellows, and as he pantomimed with his hands his tongue would follow suit. But as he came to occupy his hands more and more in his crafts, he would have to rely more on gestures of his face, tongue and lips. Then it would come about that the pantomimic action would be recognized by sound as well as by sight, and speech was thus born. Sir Richard Paget gave a number of examples from ancient and modern languages in which simple words could be derived from pantomimic gestures, so to speak, accidentally producing distinctive sounds.

PARIS

(From Our Regular Correspondent)

Aug. 27, 1928.

Course in Child Training

The course in puericulture, or child care and training, will begin, Oct. 2, 1928, at the Ecole de puériculture of the Faculté de médecine de Paris, 64 rue Desnouettes. The course is intended for nurses and midwives. The elementary course, covering a period of four months, entitles successful candidates to a certificate; the higher course, covering a period of eight months, entitles those who complete the course to a diploma. Both interns and externs are received. There are a number of full and partial scholarships for worthy pupils. The management reports an increasing number of positions open to pupils holding a diploma from this school. At present there are more positions than available graduates.

Social Movements in the Department of Calvados

The department of Calvados, in northwestern France, is one of the most active from the standpoint of social movements. The general council, the president of which is M. Henry Chéron, has studied the best means of checking the spread of tuberculosis in children. With this object in view, it has established a seaside preventorium at Gray-sur-mer on an estate offered for the purpose by Baron Gérard. This institution, which is directed by Dr. Roullé, contains more than two hundred children, ranging in age from 6 to 16. They have been taken from the contagious surroundings in which they lived, in order to give them preventive treatment. This consists mainly of life in the open air. The sunbaths are carefully regulated; and there are open-air classes. A home for mothers has been created through the influence of the prefect, M. Hélitas, Baron Gérard (deputy), and M. Henry Chéron. M. Raymond Poincaré will be present at the dedication, October 28. At Benouville is a palace built in 1775 by Claude Ledoux, architect of Louis XVI, for Admiral Sanguin de Livry. Here the general council of Calvados has decided to establish the departmental home for pregnant women and for children in need of assistance. Free care will be given expectant mothers. Other organizations have been founded to combat tuberculosis, syphilis and cancer. A departmental bureau of social hygiene has been opened at Caen, with Dr. Lebailly as director. Inoculation against diphtheria

and typhoid is done gratuitously. There is also a center of serology and of antisyphilitic propaganda. The antituberculosis dispensary for the city of Caen alone exerts a surveillance over 2,000 families. A sanatorium for women and children is being erected at St. Sever. Finally, the department of Calvados has placed at the disposal of the Office national des mutilés et réformés a large estate located at Villiers-le-Sec, where a home has been erected for the war injured with more than 30 per cent disability who are financially unable to live elsewhere.

A Home for the Protection of Children

Just outside the city of Moulins is an estate called Bellevue, which has been acquired by the government. It was originally planned to use its buildings as a sanatorium for tuberculous women, but objections were voiced in the commune of Yzeure and a suggestion was made that a home for the protection of children be created instead. Plans for this purpose are now being considered by the departmental service, and will be submitted to the general council for examination. Bellevue would serve likewise as a refuge and maternity home for needy and unmarried mothers. They would be allowed to remain as long as necessary in view of the treatment that they required themselves or that was needed by their children. This combination would have the moral advantage that unmarried mothers would no longer abandon their children. It would have also an advantage from the financial side. The Assistance publique (municipal charities) has a large number of wards that it has to care for until they reach an advanced age. With institutions such as this, the number of these wards would constantly decrease, and the budget of the Assistance publique would be relieved. There has been a suggestion to extend this protection of children still further. A child whose mother is ill, in the hospital or in a sanatorium, and whose father also is ill, or compelled to be away all the week, on account of his work, is usually taken in by the neighbors or temporarily abandoned. It is thought advisable to take such children and keep them as long as necessary.

Change of Directorship of School of Puericulture

According to the terms of a recent joint agreement, the Faculté de médecine de Paris has taken over the control of the Ecole de puériculture founded by the Association pour le développement de l'hygiène maternelle et infantile.

The Anticolibacillary Serum

M. Vincent shows that *Bacillus coli* is capable of causing certain grave disorders: septicemia and colibacillary fever, which may simulate typhoid and particularly gangrenous appendicitis, in the complications of which it plays a pathogenic rôle of the first order. This bacillus is also the ordinary causative agent, although not the only one, of acute or chronic suppurative pyelonephritis, some forms of periostitis, and various other infectious diseases. Vincent has also shown that *Bacillus coli*, of which there are a great number of species and varieties, has the property of secreting, under certain conditions, many different toxins. The author has prepared a specific serum, obtained by immunization of horses, which is active against such toxins, and is, at the same time, antimicrobic. The efficacy of the vaccine has been verified experimentally. Vincent cites a number of cures effected with anticolibacillary serotherapy in patients suffering from grave and obstinate renal infections and previously subjected without results to the usual forms of treatment: methenamine, subcutaneous and intravenous vaccines and autovaccines, and prolonged and repeated disinfection, with silver nitrate, of the bladder and the renal pelvis. As a result of the serum, *Bacillus coli* disappeared from the urine in a few days. The cure has been confirmed in patients operated on for gangrenous appendicitis with perforation of the appendix and local peritonitis, in which the serum was found to be a valuable adjuvant of an operation, by preventing the gravity of complications. The specificity of the anticolibacillary serum is very marked; but if other micro-organisms persist in the urine of the patient after the treatment, a cure is effected nevertheless, which shows that, of the various pathogenic bacteria present in the viscera of the patient, *Bacillus coli* was the most dangerous infective agent.

The Tour of the Minister of Labor

M. Loucheur, minister of labor, visited recently the sanatoriums and the dispensaries at Nantes. At Saintes, he visited the antituberculosis dispensaries, and at La Rochelle the Antituberculosis Hospital, which plans to open an antivenereal dispensary soon. Before returning, he will inspect the services of the Oeuvre antituberculeuse in Côtes du Nord. He will assist also in the dedication of the "Laënnec" antituberculosis pavilion at Argentan, department of Orne.

The Antituberculosis Dispensaries of Charente-Inférieure

The antituberculosis dispensaries of the department of Charente-Inférieure deserve special mention, as they are the pivotal centers of the antituberculosis crusade in that department. They comprise a personnel of tuberculosis specialists and visiting nurses. They never treat patients, their sole functions being: (1) the early diagnosis of the disease by means of clinical, roentgenologic and bacteriologic examinations, in order that the sick person may seek early treatment and take the necessary precautionary measures to prevent infection of his entourage; (2) the hygienic education of the patient and his associates; (3) the assurance of prophylaxis in contaminated quarters; (4) the taking of steps to place the patients in sanatoriums, and the children in preventoriums. The results are favorable, for wherever these dispensaries have been established for a sufficient length of time tuberculosis is on the wane. The dispensaries are managed by a departmental committee, working in connection with the Comité national de défense contre la tuberculose, the president of which is Dr. Rastouil of La Rochelle.

The Henri Méry Preventorium

In honor to the memory of Henri Méry, who was chief physician to the Hôpital des enfants malades and who was the organizer of preventoriums and open-air classes, the general council of the Seine, at the suggestion of M. Seillier, has named the preventorium at Fontaine-Bouillant, near Chartres (Eure-et-Loir), the Henri Méry Preventorium.

JAPAN

(From Our Regular Correspondent)

Sept. 14, 1928.

A Decline in Birth Rate

In recent years, the extrordinarily high birth rate of Japan has aroused the astonishment of the world. In connection with the food problem this has become a question of vital importance, increasing year after year. According to the records of the bureau of statistics, the numbers of births for the last half-century were: 1872, 57,000; 1883, 1,000,000; 1915, 1,500,000; 1920, 2,000,000; 1926, 2,100,000. The principal causes of the rapid rise of the birth rate after the Meiji restoration in 1868 were investigated and found to be as follows: (1) The people have married in order to have children; (2) the law has prohibited birth control, which was practiced in the Tokugawa era just before the restoration; (3) their marriages have not been contracted as early as in former times, when boys of 16 or 18 married girls as young as 13; (4) one of their principal foods is fish, which is thought to enforce the reproductive power; (5) venereal and other diseases which affect the nervous system have not been so frequent recently; (6) an income tax allowance has been made for the children, as in England.

The climax of the high birth rate seems to have come in 1926, as the births in 1927 were 50,000 less than in 1926. At the same time the infant mortality rate has become higher than ever, owing to beriberi, tuberculosis and hereditary venereal disease. As a result, the Tokyo authorities are planning to investigate all births and miscarriages to women up to 40 years of age in the city.

The population problem in Japan has been investigated only in regard to the number of births and deaths. This has been found to be unsatisfactory. Therefore the health bureau of the home ministry has decided to make these further investigations concerning all births. Investigations will be conducted on: (1) the advantages and disadvantages of birth control; (2) the interruption of reproductive power; (3) the causes of sterility, and (4) the hereditary influences of healthy and unhealthy infants.

"Bunko-Sho," a New Decoration

Japanese decorations have rarely been conferred on professional persons other than those in the army, navy, and other government services. Now, however, a new decoration called "Bunko-Sho" (Order of Merit in Culture) has been established and will be awarded to those who distinguish themselves in literary work or art, or who achieve merit in connection with the progress of human culture and social welfare. During the present emperor's coronation ceremony, to be held in November, the decoration will be conferred, for the first time, on Dr. Shiga, the discoverer of the dysentery bacillus, and Dr. Inada, the discoverer of *Spirochaeta icterohemorrhagica*.

Delegates Return from the Pan-Pacific Women's Conference

The nine delegates who attended the Pan-Pacific Women's Conference, held in Hawaii in August, arrived in Yokohama, August 31. The youngest of them was Miss Harada, daughter of the ex-dean of Doshisha University, who had been in America for three years. Mrs. Kurozaki, one of the chief delegates, states that the Japanese delegates, who were women of social prominence, were fairly successful at the conference. She hopes that the authorities will also send delegates who are qualified in politics, medicine, woman labor and education next time so that they may be even more successful.

Last Medical Examination by the Educational Department

According to the revised law, the educational department of Japan will hold its last examination for candidates to practice medicine this autumn. Two Americans, a German and a Japanese are scheduled to take it. The home ministry will conduct these examinations in the future.

Enforcement of Antivenereal Disease Laws

The new antivenereal disease laws began to go into effect, September 1. In cooperation with the Tokyo Physicians' Association and the Antivenereal Disease Society, the metropolitan police are making an attempt to have the laws understood by the responsible physicians and the public in general. Lectures and motion pictures have been given by the society in the hall of the Japan Physicians' Mutual Life Insurance Company, and in other places in Tokyo.

Health of School Girls

The records of Miss Kinue Hitomi, the sprinter and jumper, in the international Olympic games at Amsterdam, show the gigantic physical stride that has been made by Japanese girls. According to statistics the average height of Japanese school girls has increased exceedingly of late. They are more inclined toward athletics than their mothers were. They play tennis and basketball, and swim. It is reported, however, that 50 per cent of the girls in the secondary schools have decayed teeth and that 40 per cent have eye disorders (mainly nearsightedness). The authorities, therefore, are making them pay more attention to the condition of their teeth and eyes. They attribute their bad teeth to their fondness for sweets, and their nearsightedness to reading books printed in small type.

AUSTRALIA

(From Our Regular Correspondent)

Sept. 1, 1928.

Studies of Snake Venom

At the Walter and Eliza Hall Institute of Research in Pathology and Medicine, Melbourne, Dr. N. Hamilton Fairley has been investigating the venoms of Australian snakes with the object of preparing an antitoxic serum. The cooperation of the Melbourne zoological gardens, the commonwealth serum laboratories and Mr. T. E. Eades, "the most snake-bitten man in Australia" was necessary in the course of these studies. The first objective was the collection of sufficient venom of Australia's most dangerous snakes—the tiger snake and the death adder—to enable the first year's supply of immunization material to be available. A beginning of the antitoxin production has now been made.

A new approach to the study of ophidian dentition has been opened up by the application of modern dental technic to the reptilia. A routine impression has been taken of the bite of every reptile by means of Kerr's impression compound. Amalgam models have then been constructed so as to demonstrate the actual position of the fangs during penetration of the substance bitten. An interesting practical result of this work is that the distance separating the fangs has been found to be definitely correlated with the venom yield on biting. This applies to the tiger snake, the death adder and copperhead. If the distance does not exceed 1 cm. the amount injected is not likely to have been large, but if greater than 1.5 cm. several lethal doses have probably been deposited in the subcutaneous tissues.

Care has been taken to differentiate between the quantity of poison released during an actual bite and that obtained by "milking" the venom glands. In the case of the tiger snake from 5 to 60 mg. of venom (weighed after drying in a vacuum over sulphuric acid) were obtained by biting, whereas digital expression of the gland yielded up to 150 mg. Three milligrams is a lethal dose for a horse. The venom of the tiger snake is more potent than all other known venoms with the possible exception of the sea snake, *Enhydrina Valakadyen*.

The histologic effects of the Australian snake venoms are also being studied.

The Hospital Problem of Melbourne

"This will be the site for a village" exclaimed John Batman in 1835, as he stepped ashore on the banks of the River Yarra. Today, less than a century later, nearly a million people are organized into a community about this original site. Such phenomental growth has naturally brought many problems in its train. One of these is the provision of hospital facilities for the rapidly expanding community.

In 1859, nearly 5 acres of land on what was then the outskirts of the city were granted by the crown for hospital purposes. The original buildings later became inadequate and the hospital was rebuilt in 1912. This action is considered by many to have been an unwise procedure, as the limit to convenient expansion was soon reached and buildings were erected to a value of £350.000.

The state of affairs is at present being brought into prominence as a result of an offer by a business syndicate of £750,000 for the hospital site, which occupies a whole block. This offer would seem at first thought to be a heaven-sent opportunity to rebuild the hospital on a larger scale on a fresh site that would

have sufficient "breathing room" to permit of extensive expansion. A more careful investigation, however, reveals the necessity for serious weighing of pros and cons. In the first place, it is apparent that by the time the new hospital would be completed, possibly five years, the value of the original site would be considerably increased. Secondly, the advisability of retaining the land for other public purposes must be considered. Thirdly, it is now difficult to secure a sufficient area of land in the immediate vicinity of the Medical School of the University of Melbourne.

It is unlikely that the offer will be accepted. The Victorian state government, which legally dominates the situation, is determined to adhere to its policy of providing for the extension of existing metropolitan hospitals (where possible), and the erection of a small clinical hospital at the university.

The Cost of Medical Care

The economic aspect of what is usually classified as preventive and curative medical service constitutes a problem which is being forced on the consideration of Australian medical men, administrators and the public. The formation of an American committee which will study this problem gives promise of valuable conclusions which should influence medical economic thought throughout the world. It would seem that neither America nor Australia are peculiar in these difficulties. The statements are ventured that the problem is world wide and that the ideal solution has yet to be demonstrated. In Australia, alike with other countries, various schemes have been formulated and given their trial on the proving ground of everyday usage. It is proposed, during the course of these letters, to describe the conditions as found in this country and the serious attempts that have been and are being made to solve the problems they represent.

BELGIUM

(From Our Regular Correspondent)

Aug. 23, 1928.

The Proposed Creation of a Council on Medical Ethics

In previous letters, the problem of the creation of an *ordre de médecins*, with a council on medical ethics, has been frequently discussed. The Royal Academy of Medicine appointed a commission to study the problem, and the commission has proposed the following bill to be acted on by parliament:

Article 1. A legal "ordre de médecins," with a council on medical ethics, is hereby created.

Article 2. The recognized members thereof shall be all the practitioners enrolled in the lists drawn up by each of the provincial medical commissions of Belgium, created in conformity with article 10 of the royal decree of May 31, 1880, reorganizing the medical commissions.

Article 3. These practitioners, at a meeting to be held solely for this purpose, will elect a council on medical ethics to be composed of six physician members, who will choose, from their own number, a president and a secretary. There shall be elected also a like number of alternate members. The council shall always sit as a body.

Article 4. The seat and the jurisdiction of the councils on medical ethics, and the mode of holding elections shall be the same as those of the provincial medical commissions, as they were organized by the royal decree of Feb. 28, 1895, and modified by royal decree of Aug. 17, 1925.

Article 5. The members of the councils (regular and alternate members) are appointed for six years, the terms of half of the members expiring every three years. After the first election, it shall be determined by lot which of the regular and which of the alternate members shall serve, by exception, only three years.

Article 6. The jurisdiction of the councils shall extend to all questions of professional deontology, including charlatanism and fraternal deontology.

Article 7. The councils on medical ethics may be consulted by the courts with regard to violations of common law, in both civil and criminal matters.

Article 8. All complaints are transmitted to the bureau of the council, which investigates them before summoning the council, though that course may not be taken at all. If the complaint concerns a difference between certain parties, the bureau will endeavor to conciliate them. If that attempt fails, the bureau will convoke the council.

Article 9. The punishments that may be imposed by the council are: warning, censure, temporary suspension for a certain period not to exceed one year, and exclusion and removal from the register of the *ordre de médecins*.

Article 10. The council will not resort to any of these penalties until after having heard (or summoned twice, with an interval of fifteen days) the accused practitioner, who shall be entitled to fifteen days in which to prepare his defense.

Article 11. The warning or the censure is imposed directly by the bureau.

Article 12. The penalties providing for suspension or exclusion may be appealed to a higher jurisdiction.

Article 13. The body of higher jurisdiction is composed of a council of six physician members (corporate members or Belgian correspondents) of the Royal Academy of Medicine of Belgium elected, by secret ballot, by the corporate members and the Belgian correspondents of the academy. An equal number of alternates will be designated at the same election. The members will be elected for a term of six years, but half of the members will be chosen every three years. Connected with the council there will be a bureau constituted by the perpetual secretary of the academy, who will perform the duties of secretary, and the presiding councilor of the court of cassation (the supreme court), who is appointed by the *premier président*.

Article 14. The penalties to be imposed shall be determined by a majority vote of the councils on medical ethics. In case of a tie, the president shall cast the deciding vote. The penalties brought before the appeal jurisdiction will be confirmed, modified or rejected by a majority vote of the whole body, if it is a matter of suspension, but exclusion will require a unanimous vote, the president having only the right to express an opinion, when consulted.

Article 15. When the penalty imposed involves suspension or removal, the decision is communicated, for the purpose of execution, through the mediation of the bureau, to the president of the provincial medical commission of the jurisdiction in which the guilty party has his legal residence.

Dedication of the Bust of Depage

A large assemblage of physicians attended the recent unveiling of the bust of Depage, which is the work of G. Devreese. Prof. Jean Verhoogen, president of the Antoine Depage Foundation, presented the bust to the commune of Ixelles. He called attention also to the fact that with the funds contributed it had been possible to create the "health center," dedicated the same day, and a laboratory of experimental surgery at the University of Brussels. After the unveiling of the bust, the queen, who attended the ceremonies, visited the "health center," which is dedicated to the memory of Marie and Antoine Depage. The health center is furnished and equipped in the most modern manner, and includes the following eleven services: a consultation center on infant welfare (Oeuvre nationale de l'enfance), an antituberculosis dispensary (Ligue nationale belge contre la tuberculose), an antivenereal dispensary (Ligue nationale belge contre le péril vénérien), dispensary of mental hygiene (Ligue nationale belge d'hygiène mentale), dispensary for treatment with ultraviolet rays (Association nationale contre la tuberculose), Oeuvre de la préservation de l'enfance contre la

tuberculose, dispensary of buccal and dental hygiene (Association générale des dentistes de Belgique), work-shop, library, information office, and lectures and various courses.

Nurses from various schools are received for short periods of training. Ambulance women nurses (*ambulancières*) are likewise admitted for practical work.

A Short Postgraduate Course in Nursing

The national federation of the Ecoles d'infirmières de Belgique has organized a postgraduate course in nursing, the purpose of which is to contribute toward the training of Belgian teachers' assistants capable of collaborating efficiently in the training of professional nurses. The lessons in theory and practice are open to graduate nurses selected by the schools, and will be given by well qualified specialists.

The Death of Prof. Charles Firket

The University of Liége has met with a severe loss in the death of Prof Charles Firket. Professor Firket established the instruction in pathologic anatomy at the University of Liége; also the service for the examination of tumors. He was one of the first to understand the colonial work of Belgium, and developed the instruction in tropical pathology. He was president in 1923 of the Academy of Medicine.

Doctor of Anthropologic Science

The University of Liége has created the degree of doctor of anthropologic science. The studies on which the degree and diploma are based comprise the following ten subjects: physical anthropology, systematic human anatomy, general and special human physiology, ethnography and ethnology, geography of the human species, the elements of sociology, the elements of the science of language, human paleontology, prehistoric archeology, and the geology of the Quaternary period (the Age of Man).

BERLIN.

(From Our Regular Correspondent)

Sept. 1, 1928.

Berlin's Declining Birth Rate

There was a slight excess of deaths over births in Berlin in 1926. A recent report on the vital statistics shows a greater excess in 1927. The total number of births for 1927 was 42,696, or only 10.2 per thousand of population. The total number of deaths was 48,742. Thus the excess of deaths over births was 6,046. However, owing to the excess of immigration over emigration, which amounted to 81,132, the city continues to grow. As the housing problem in Berlin is not yet fully solved, the increase in population of more than 75,000 is not as welcome as it would be otherwise.

Vital Statistics of Germany for 1927

In the vital statistics of Germany for 1927, the increase in the number of marriages is especially significant. In 1926, there were 483,198 marriages contracted; for 1927, the number was 538,525, an increase of 11.5 per cent. This increase from 7.8 per thousand population, in 1913, to 8.5 per thousand in 1927 is all the more striking in view of the fact that the percentage of married men was already much higher than in the prewar period. The increase was especially marked in the large cities (Berlin, Hamburg, Bremen), and in certain provinces or states: Saxony (18 per cent), Upper Silesia, and Thuringia. The Prussian Bureau of Statistics ascribes the increase to the fact that the proportion of persons of marriageable age to the whole population was much greater than before the war. In 1910, Prussia, with a population of 40,000,000, had 22,300,000 above the age of 20, whereas, in 1925, with a population of 38,000,000, there were 24,200,000 above the age of 20. Unfortunately, in spite of the increase in the number of marriages, there was a deplorable decline in the number of births. If we note further that the number of women of child-bearing age in the whole population is 2,700,000 greater than before the war, and that, in spite of that fact, the number of living births was decreased by about 445,000, the decrease in the number of births appears even more significant. In Berlin, the birth rate has fallen from 19.4 (1913) to 10.6 (1927).

The total number of deaths in 1927 was 757,000, or 22,900 more than in 1926. The death rate in 1913 was 14.8; in 1927, 12.0. The increase of the mortality for 1927 over that of 1926 was due chiefly to the influenza epidemic of the first quarter and to the unfavorable weather conditions, especially during the last quarter of 1927. The infant mortality for 1927 shows a further decline. Owing to the drop in the birth rate and to the increase in the death rate, the net gain in population for 1927 was 90,000 less than for 1926. The excess of births over deaths (403,000) is only about half that of the prewar period.

Appendicitis in Bavaria

During the past twenty years, appendicitis has apparently been more prevalent than it was before. It may be that there is no increased tendency to the disease but that the increase of morbidity is due to improved diagnosis and to the education of the population that early operations are of unquestionable advantage. In 1908, the first year in which we have records of appendicitis cases, 1,444 males and 1,373 females (a total of 2,817) were treated for appendicitis, in the general hospitals. In 1913, the number had increased to 6,200, and in 1926 to 17,340. The adjoining tabulation shows, in a general way, the increases for the period 1920-1926.

Appendicitis Cases, 1920-1926

	Case Morbidity			No. Cases per Thousand Population		
	Males	Females	Average	Males	Females	Average
1920	2,983	3,763	6,746	8.6	10.0	9.3
1924	5,611	6,513	12,124	15.7	16.9	16.3
1925	7,736	8,422	16,158	21.8	22.0	21.9
1926	7,966	9,374	17,340	22.2	24.3	23.3

Of the patients treated in 1908, 153, or 5.4 per cent, died. Later the number of deaths increased, but the percentage of deaths to the number of cases appears to have improved. In 1925 and 1926, the case mortality was only 1.6 per cent (262 and 280 deaths, respectively).

The total mortality from appendicitis, including patients within and outside the hospitals, is represented in the adjacent tabulation.

Deaths from Appendicitis

	Totals	Deaths per Ten Thousand Population
1908	510	0.76
1920	520	0.73
1924	559	0.75
1925	605	0.82
1926	578	0.78

The deaths from appendicitis, therefore, have increased in about the same proportion as the population.

The Midbrain

As Professor Leschke stated in an address before the Internationale Gesellschaft für empirische Philosophie, clinical observations have established the importance of the brain-stem. Observations of patients with diabetes insipidus have shown that a disorder of the tuber cinereum at the base of the midbrain produces an insatiable thirst, which forces patients to ingest up to 10 liters of fluid daily. Thus the tuber cinereum is, apparently, the regulatory center for the water and salt balance of the body. Likewise, hunger is produced by the activity of the midbrain, as is shown by numbers of patients who suffer from hyperorexia. Pavlov furnished proof of this by his experiment on dogs in which he removed the cerebrum and preserved the midbrain. Also a child who continued to live for some time without the cerebrum manifested hunger and even reacted to

circumscribed, differentiated test stimulations. We are hungry when the vital organs feel the need of nutrients, and not when the stomach is empty; for, through injection of sugar solution into the blood, the sense of hunger ceases immediately, whereas filling the stomach with substances without nutritive value suppresses the sense of hunger for only a short time, as was experienced by many, during the war. In connection with influenza of the brain, which affects the midbrain, complete anorexia continuing for six months has been observed. In disordered conditions of the pituitary body and of the midbrain, also changes in sexual manifestations and deterioration of the genitalia have been observed. The hours of sleeping and waking are likewise controlled by this region. Though our reason may endeavor to keep us awake, we may be unable to resist the desire to sleep. Pflüger's conception that sleep is induced by the exclusion of external stimuli was formerly accepted. This theory will not, however, explain the fact that after eight hours we awaken in spite of the absence of external stimuli. Since we cannot sleep with the eyes open, the sleep center has been sought in the vicinity of the center of vision. Pavlov's experiments with dogs that were trained to eat only when a certain note was sounded have shown that dogs, in the absence of the stimulation of food, will finally fall asleep. From this fact it is evident that every long continued stimulus applied to the cerebrum serves as a check on the gray matter that lies beneath the cortex. Falling asleep is influenced by such "conditioned reflexes." Among these may be mentioned the accustomed bedroom, which explains why many persons do not fall asleep readily when traveling and occupying strange apartments. Disorders of the sleep center may produce permanent sleep or sleeplessness. After one awakes, the desire to become active arises, which is likewise a normal impulse. It constitutes an important attribute of personality, and expresses itself also in the play impulse of the child. The desire to dance comes under the same category. Also the desire for new experiences or for adventure partakes of the nature of a compelling impulse. The "energizer," or the force impelling us to action, lies in the corpus striatum, as becomes evident from the observation of patients with a desire to keep constantly moving. In influenza of the brain one often finds this compelling impulse associated with a lack of social instincts, especially in juveniles. It leads to deterioration of the emotions and to the commission, under compelling impulse, of asocial acts, or misdemeanors. The parts of the brain that are older, from the embryonal and developmental standpoint, such as the brain-stem, are thus the centers of the impulses. The suppression of these impulses by ascetic teachings Leschke declares to be impossible. Through the activity of the cerebrum they can, however, be ennobled and spiritualized. These conceptions of the emotional life of the individual have not been reached by speculation but by observations in the modern clinic, whereby an endeavor has been made to get a clear understanding of the essential nature of the psychophysical personality.

Marriages

RUSSEL FLETCHER WILSON, Spartanburg, S. C., to Miss Aloe Everton of Jacksonville, Ga., in Augusta, recently.

WILLIAM SMITH TILLETT, New York, to Miss Dorothy Stockbridge, at Stonington, Conn., September 8.

THOMAS MCG. LOWRY, New York, to Miss Frances Sellery of Toronto, Ont., Canada, September 7.

PAUL WILLIAM FERRY to Miss Lenore Anna Johnson, both of Kokomo, Ind., July 16.

GORDON RICHARD KAMMAN, to Miss Patricia Grant, both of St. Paul, in September.

HARRY LE FEVER, Columbus, Ohio, to Miss Grace Riggs of Pittsburgh, recently.

Deaths

Greenfield Sluder ✠ St. Louis; medical department of St. Louis University, 1888; instructor in clinical medicine at his alma mater, 1891-1896; lecturer in laryngology, 1898-1905; professor of otolaryngology and director of the department for more than twenty years; on the staff of the Barnard Free Skin and Cancer Hospital and St. Luke's Hospital; assistant surgeon and chief of the laryngologic clinic, St. Louis Children's Hospital; chief of the laryngologic clinic at the O'Fallon dispensary; member and recently president of the American Laryngological Association; member of the American Academy of Ophthalmology and Oto-Laryngology, of the American Laryngological, Rhinological and Otological Society and of the American Association of Anatomists; author of Headaches and Eye Disorders of Nasal Origin, and of a method of tonsillectomy, and a frequent contributor to medical journals; aged 62; died at Barnes Hospital, October 9, following amputation of his right leg after a long illness.

Thomas C. Kennedy, Indianapolis; Kentucky School of Medicine, Louisville, 1883; past president of the Indiana State Medical Association; member of the American Radium Society; at one time clinical professor of gastro-intestinal surgery, Indiana University School of Medicine; on the staff of the Indianapolis City Hospital; in 1890 delegate to the tenth International Medical Congress in Berlin; aged 66; died suddenly, September 14, of cerebral hemorrhage.

Mefford Runyon ✠ South Orange, N. J.; Medical Department of Columbia College, New York, 1887; past president of the Essex County Medical Society; on the staff of the Orange (N. J.) Memorial Hospital; surgeon and owner of a hospital bearing his name; aged 66; died, September 20, at his summer home in Edgartown, Mass., of heart disease.

George Henry Packard, Meredith, N. H.; College of Physicians and Surgeons, Baltimore, 1898; member of the Massachusetts Medical Society and the Medical Society of the State of North Carolina; aged 63; died, September 10, at the Peter Bent Brigham Hospital, Boston, of heart disease and pneumonia.

Charles Stough Rebuck ✠ Harrisburg, Pa.; College of Physicians and Surgeons, Baltimore, 1896; member of the American Academy of Ophthalmology and Oto-Laryngology; aged 54; on the staff of the Harrisburg Hospital, where he died, September 7, of acute nephritis and pelvic peritonitis with abscess.

Walter Dodge ✠ Orange, N. J.; Medical Department of Columbia College, New York, 1893; at one time pathologist to the boards of health of Orange, West Orange and South Orange; formerly on the staff of the Orange Memorial Hospital; aged 60; died, September 4, of bronchopneumonia.

Mary Torrey Roudebush ✠ Norman, Okla.; Johns Hopkins University School of Medicine, Baltimore, 1920; member of the Tennessee State Medical Association; resident physician for women, University of Oklahoma; aged 35; died, September 14, of heart disease and asthma.

James Raymond Morgan, Providence, R. I.; Harvard University Medical School, Boston, 1873; member of the Rhode Island Medical Society; aged 81; on the staff of the Rhode Island City Hospital, where he died, September 25, of arteriosclerosis and bronchopneumonia.

Richard Walter Long, Madisonville, Ky.; Kentucky School of Medicine, Louisville, 1898; member of the Kentucky State Medical Association; served during the World War; aged 51; died, September 11, at the Madisonville Hospital, of heart disease and diabetes mellitus.

Oscar Ellis Chase ✠ Chicago; University of Michigan Medical School, Ann Arbor, 1899; member of the Central States Pediatric Society; formerly clinical instructor in pediatrics, Rush Medical College; aged 57; died, September 16, of gangrenous appendicitis.

William Elmore Wilson, Mooresville, N. C.; Louisville (Ky.) Medical College, 1886; member of the Medical Society of the State of North Carolina; formerly on the staff of the Lowrance Hospital; aged 64; died, September 6, of chronic catarrhal colitis.

William Riley Bolding, Marshalltown, Iowa; University of Nebraska College of Medicine, Homeopathic Department, Lincoln, 1884; Civil War veteran; aged 85; died, August 29, at the Iowa Soldiers' Home Hospital, of arteriosclerosis with hypertension.

Frederick G. Kohler ✠ Minneapolis; Medical Department Hamline University, Minneapolis, 1897; served during the World War; aged 52; died, August 2, at the Eitel Hospital, of heart disease and peritonsillar abscess following septic sore throat.

Judson H. Long, Moline, Ill.; Marion-Sims College of Medicine, St. Louis, 1896; member of the Illinois State Medical Society; aged 58; on the staff of the Moline City Hospital, where he died, September 26, following an operation for gastric ulcer.

Caroline Elizabeth Spencer, Colorado Springs, Colo.; Woman's Medical College of Pennsylvania, Philadelphia, 1892; aged 65; died, September 16, at the home of her sister in Philadelphia, of pulmonary tuberculosis and mitral regurgitation.

Charles Henry Stowell, Lowell, Mass.; University of Michigan Medical School, Ann Arbor, 1872; formerly professor of histology and microscopy at his alma mater; aged 77; died, September 17, of arteriosclerosis and cerebral hemorrhage.

Robert John Conroy, Medford, Ore.; McGill University Faculty of Medicine, Montreal, Que., Canada, 1900; member of the Oregon State Medical Society; aged 53; died suddenly, September 12, at Salt Lake City, Utah, of heart disease.

Albert Wilkin Slaughter, Paris, Ill.; Louisville (Ky.) Medical College, 1904; member of the Illinois State Medical Society; served during the World War; aged 48; died, September 25, of hemorrhage due to gastric ulcer.

Daniel Ralph Lucas, Wilton, Conn.; Columbia University College of Physicians and Surgeons, New York, 1907; member of the Connecticut State Medical Society; served during the World War; aged 47; died, September 11.

Clarence C. Jones, Staunton, Va.; Baltimore Medical College, 1903; member of the Medical Society of Virginia; aged 53; on the staff of the King's Daughters' Hospital, where he died, July 10, of myocarditis and nephritis.

Franklin Brady ✠ Philadelphia; Jefferson Medical College of Philadelphia, 1888; on the staff of the Samaritan Hospital and formerly on the staff of the Kensington Hospital; aged 72; died, September 9, of angina pectoris.

William Zabriskie Dahl ✠ Sacramento, Calif.; College of Physicians and Surgeons of San Francisco, 1904; member of the American Urological Association; aged 47; died, in January, of chronic nephritis.

Edward Clark Winans, Chicago; Medical Department of the University of Illinois, Chicago, 1899; aged 58; on the staff of the Illinois Central Hospital, where he died, August 8, of myocarditis and nephritis.

Arthur Bartlett Kellogg, Los Angeles; New York Homeopathic Medical College and Hospital, 1897; member of the California Medical Association; aged 56; died, September 8, of myocarditis.

Abram Walter Askins, Findlay, Ill.; Barnes Medical College, St. Louis, 1899; member of the Illinois State Medical Society; aged 56; was found dead in bed, September 16, of heart disease.

Charles Hilary Boehm ✠ Wilmington, Del.; University of Pennsylvania School of Medicine, 1909; on the staff of St. Francis Hospital; aged 42; died, September 8, of pulmonary tuberculosis.

Winfield Scott Montgomery, Washington, D. C.; Howard University School of Medicine, Washington, 1890; aged 74; died, September 11, of arteriosclerosis and acute dilatation of the heart.

John Garland Hendrick, Central City, Ky.; Kentucky School of Medicine, Louisville, 1866; University of Louisville School of Medicine, 1868; aged 85; died, September 23, of senility.

Benjamin Franklin Winsett, Los Angeles; Chicago Homeopathic Medical College, 1886; aged 66; died in August, of hypernephroma with metastases to the lungs, heart and left femur.

Floyd W. Smith, Dayton, Ohio; Jefferson Medical College of Philadelphia, 1900; member of the Ohio State Medical Association; aged 61; died, September 1, of acute dilatation of the heart.

David Edward Spahr, Xenia, Ohio; Fort Wayne (Ind.) College of Medicine, 1879; member of the Ohio State Medical Association; aged 76; died, September 11, of chronic prostatitis.

John Howard Allwein ✠ Scranton, Pa.; University of Pennsylvania School of Medicine, Philadelphia, 1892; aged 59; died, August 17, at the Hahnemann Hospital, of heart disease.

Eugene Virolle, Montreal, Que., Canada; University of Montreal Faculty of Medicine, 1898; formerly associate professor of anatomy at his alma mater; aged 54; died, July 14.

Robert Christian Poos, Okawville, Ill.; American Medical College, St. Louis, 1884; member of the Illinois State Medical Society; aged 71; died, September 18, of acute myocarditis.

Jesse E. Seale, Meridian, Miss.; Memphis (Tenn.) Hospital Medical College, 1893; on the staff of the Matty-Hersee Hospital; aged 61; died, September 9, of cerebral hemorrhage.

William S. Conover, Utica, N. Y.; Medical Department of the University of the City of New York, 1877; aged 83; died, March 15, at the Masonic Hospital, of arteriosclerosis.

Ludwell G. Glenn, Riverside, Calif.; Columbus (Ohio) Medical College, 1877; aged 69; died, August 11, at the home of his son in Los Angeles, of carcinoma of the stomach.

Charles G. MacCallion, Washington, D. C.; University of Vermont College of Medicine, Burlington, 1891; aged 75; died, July 26, at Pottersville, Mass., of mitral insufficiency.

Jerry Sterling Cooper, Roanoke, Va.; Leonard Medical School, Raleigh, N. C., 1909; aged 43; died, September 9, at a sanatorium in Burkeville, of pulmonary tuberculosis.

T. Blake Ramsay, Ste Anne de Bellevue, Que., Canada; University of Western Ontario Medical School, London, 1910; aged 42; died, March 19, of pulmonary tuberculosis.

Angus Price Sutherland ✠ Detroit; University of Michigan Medical School, Ann Arbor, 1914; served during the World War; aged 39; died, September 8, of pneumonia.

John Werner Crenshaw, Chicago; University of Virginia Department of Medicine, Charlottesville, 1875; aged 80; died, September 8, at Cloverport, Ky., of heart disease.

Thomas W. Hague, Cumberland Hill, R. I.; University of Vermont College of Medicine, Burlington, 1884; aged 69; died, February 28, of chronic interstitial nephritis.

Ernest Reginald Grasty, Danville, Va.; Leonard Medical School, Raleigh, N. C., 1914; aged 39; died, February 29, at the Central State Hospital, Petersburg.

John Henry Tyler, Winchester, Ky.; Meharry Medical College, Nashville, Tenn., 1898; aged 54; died, August 8, at Louisville, of interstitial nephritis.

George Leslie Atkins ✠ Jackson, Minn.; State University of Iowa College of Medicine, Iowa City, 1905; aged 52; died, September 13, of heart disease.

William P. Sims ✠ Boz, Texas; Vanderbilt University School of Medicine, Nashville, Tenn., 1888; aged 64; died, September 12, of heart disease.

William Lyle Kinmouth, Belmar, N. J.; United States Medical College, New York, 1881; aged 77; died, August 29, of cerebral hemorrhage.

Daniel Christopher Montgomery, Thomasville, Ga.; Southern Medical College, Atlanta, 1886; aged 70; died suddenly, September 11.

Ida Estelle Gaston ✠ Philadelphia; Woman's Medical College of Pennsylvania, Philadelphia, 1893; died, September 21, of heart disease.

Richard Jeffries Morgan ✠ Van Wert, Ohio; Jefferson Medical College of Philadelphia, 1890; aged 62; died, August 21, of heart disease.

William Wirt Wendover, Warwick, N. Y.; Medical Department of Columbia College, New York, 1874; aged 70; died recently.

Lester Howard Jordan, East Raymond, Maine; Medical School of Maine, Portland, 1873; aged 78; died, August 25, of pneumonia.

Ephraim Northcott, San Francisco; Michigan College of Medicine and Surgery, Detroit, 1894; aged 64; died, in July, of pneumonia.

Owen Andrew Jackson Morrison, Frankfort, Ind.; Fort Wayne College of Medicine, 1880; aged 83; died, September 12, of nephritis.

George Jarvis Bowens, Norfolk, Va.; Leonard Medical School, Raleigh, N. C., 1891; aged 59; died, June 6, at New York.

Alfred Augustus Lovett, Eaton, Ohio; Hahnemann Medical College of Philadelphia, 1876; aged 79; died, August 31.

John Calvin Barr, McAlevys Fort, Pa.; Jefferson Medical College of Philadelphia, 1890; aged 73; died, August 3.

Eli Whitlatch, Columbia, Iowa (licensed, Iowa, 1886); aged 80; died, September 3, of cardiovascular disease.

Bureau of Investigation

MU-SOL-DENT

"Mu-Sol-Dent" is marketed by the V. B. Corporation of Pittsburgh, Pennsylvania, as "the only existing nonirritating, efficient solvent of mucin and mucus." It is said to be "efficient in the prevention and treatment of sore throat and colds" and a product that will greatly hasten the healing of wounds and burns. Especially is it recommended for the removal of mucin plaques and film on teeth.

One of the chief advertising assets of Mu-Sol-Dent is the reproduction of a "Certificate of Discovery" issued by the Mellon Institute of Industrial Research, Pittsburgh. This certifies that one C. C. Vogt, who was an Industrial Fellow at the Institute, discovered and perfected the formula of Mu-Sol-Dent. Such a certificate was issued by the Mellon Institute some years ago and, as such, referred exclusively to the chemistry of the product and not, in any sense, to the therapeutic claims that later were made for it. Several years ago the Mellon Institute discontinued issuing "Certificates of Discovery" and does not countenance the use that the V. B. Corporation has made of the old certificate issued to C. C. Vogt.

While Mu-Sol-Dent may seem to be of greater interest to the dental profession than to the medical, the medical claims made for it and the number of letters of inquiry which THE JOURNAL has received in regard to it, indicate that it is a subject of some interest to physicians. It is for this reason that an article appearing in the October issue of the *Journal of the American Dental Association* is of more than academic interest to the medical profession.

The national organization of dentists has recently turned its attention to the problem of giving its members and the public the facts regarding widely advertised medicinal preparations in the dental field. As the first step in this work, the American Dental Association secured the services of a competent chemist, who is working in the Laboratory of the American Medical Association, which has placed its facilities and experience at the disposal of the dental organization. Mu-Sol-Dent is the first preparation investigated by the A. D. A. chemist, and the report published in the official organ of the American Dental Association marks a milestone in the progress of our sister profession.

As a result of the work done by the A. D. A. chemist on Mu-Sol-Dent, it seems that this product is essentially a solution of common salt, potassium chloride and trisodium phosphate in water, in approximately these proportions:

Sodium Chloride	77 grains
Potassium Chloride	26 grains
Trisodium Phosphate	32 grains
Water	1 quart

There are, of course, in Mu-Sol-Dent also minute quantities of certain aromatic essential oils and coloring matter. And this is the preparation that is said to prevent tooth decay, tartar and pyorrhea, and to be good for catarrh, hay-fever and sore throat. It is but fair to say that the exploiters of Mu-Sol-Dent, while recommending their product for "bad breath," do not, so far as we have been able to discover, use the word "halitosis." Due credit should be given them for such restraint.

Correspondence

NOMENCLATURE IN RADIOLOGY

To the Editor:—I have read with interest and, with one exception, approval the "Recommendations of the Subcommittee on Nomenclature" in Radiology.

Section 14 of the Recommendations contains the statement that the word "x-ray" should not be used as a verb, as, for example, a request to "x-ray a patient."

No alternative verb conveying the same meaning is offered. "To radiograph" implies only a film or plate examination. "To roentgenograph" has the same limitations and is furthermore condemned on other grounds. It seems that the committee has offered no verb to cover the routine of radiologic examination where both films and the fluoroscope are used and it seems to me, therefore, almost certain that "x-ray" will continue to be used as a verb until finally justified by usage, as the only evident alternative phrase, "to make an x-ray examination," is too cumbersome to be followed by other members of the profession even if radiologists themselves were to abide strictly by the letter of the recommendations.

C. D. ENFIELD, M.D., Louisville, Ky.

TUBERCULAR VERSUS TUBERCULOUS

To the Editor:—I have just consulted that wonderful treasure house the Oxford Dictionary, as to the use of "tubercu*lar*" and "tubercu*lous*."

The dictionary gives, in brief, under "Tubercu*lar*," (Nat. Hist.) "of the nature or form of a tubercle."

(Path.) "Of, pertaining to, caused or characterized by, or affected with tubercles," for example, nodular or tubercular leprosy, tubercular syphilis, neither of these being caused by the tubercle bacillus.

Under "Tubercu*lous*" the dictionary says, "Since 1882 almost always used specifically in reference to the Tubercle Bacillus or to Tuberculosis and thus technically distinguished from Tubercu*lar* in the general sense."

We ought to follow the definition of the Oxford Dictionary, which is, of course, for all English-speaking people, the highest authority.

W. W. KEEN, M.D., Philadelphia.

COMMENT.—For many years the publications of the American Medical Association Press have followed the usage here set forth.—EDITOR.

FRACTURES OF THE ANKLE

To the Editor:—In THE JOURNAL, September 22, is a paper by Dr. Frank D. Dickson, Kansas City, on fractures of the ankle.

In fractures of the ankle in addition to fracture of the inner malleolus with separation of the fragments and fracture of the fibula with overlapping of the fragments, there is frequently backward displacement of the foot on the tibia. In the directions given by Dr. Dickson for the reduction of the fracture he has overlooked the simple and necessary directions given by Percival Pott, namely, to reduce the fracture satisfactorily, and particularly the backward displacement of the foot, it is necessary to manipulate the foot with the knee flexed in order to relax the calf muscles fully.

JOHN RIDLON, M.D., Chicago.

Queries and Minor Notes

Anonymous Communications and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

FORMULAS FOR INJECTION OF VARICOSE VEINS

To the Editor:—Here is a formula I have seen used in the treatment by injection of varicose veins:

Solution of sodium salicylate..... 25 per cent
Solution of sodium chloride..... 10 per cent, equal parts.

Has this treatment passed the experimental stage? Also, it is stated that, on an average, three sittings are required. About what interval is observed between them? Another solution used, about the same, is as to dosage:

	Gm. or Cc.
Quinine dihydrochloride or hydrochloride.....	4
Urethane	2
Distilled water.....sufficient to make	30

In the first solution, would it be satisfactorily sterile if made up in sterile water, and then boiled for a couple of minutes?

H. J. Day, M.D., White Lake, S. D.

Answer.—The injection treatment has a definite place in the treatment of varicose veins and their sequelae, such as the ulcer and the eczema. The action of such obliterating injections consists of an irritative endophlebitis. If the injected vein can be collapsed and the injured intimal surfaces can be kept in contact for the first twenty-four or, preferably, forty-eight hours, a firm organization takes place between the injured surfaces of the vein. If a thrombus forms, this too is organized rapidly and is less likely to break loose than a thrombus which forms in a stagnant circulation and does not organize well.

The injection treatment is contraindicated if the deep venous circulation is obstructed; it is not advisable if there is any impairment of the arterial circulation, which is frequently the case in older patients with arteriosclerosis; it is also contraindicated in the presence of an acute or subsiding superficial phlebitis, as it may flare up an infection at the site of injection. In case of very large venous dilatations on the thigh, one might consider a preliminary ligation of the internal saphenous vein, in order to reduce the venous back pressure, which may easily canaliculize again the obstructed vein.

Age, hypertension, diabetes and pregnancy are no contraindications; on the contrary, one would rather advise an injection treatment than a radical removal. The latter can be successful only if it is very extensive.

There is quite a difference of opinion as to the solution used. Both solutions named by our correspondent are highly irritating substances. Their obliterating action is prompt, but a drop or two of such solutions injected beside or in the wall of the vein will cause necrosis. Also there is considerable cramping following the first few minutes after the injection. Nevertheless, many men recommend their use. The injection of from 5 to 10 cc. of a 50 per cent dextrose solution causes less reaction. It is true, however, that the hypertonic dextrose solution is much more bland than the foregoing mixtures and that one injection does not always obliterate the vein completely and may have to be repeated.

The number of injections varies with the extent and type of varicosities. The injections are usually made twice a week, two or three segments being injected at one sitting. It is impossible to foretell the extent of obliteration following one injection, as this will vary greatly in different patients.

The solutions can be boiled on an open flame or in a water bath for ten minutes or autoclaved with the dressings. The dextrose solution can also be had in ampules and their sterility is reliable.

METHODS OF ADMINISTERING CALCIUM LACTATE

To the Editor:—Many operators prescribe calcium prior to operation, especially tonsillectomy, with calcium lactate the favorite. Can you tell me of any better form of calcium to exhibit under such conditions, or a pleasant tasting liquid prescription for calcium lactate, in place of the tablet form, or other better form of calcium in liquid prescription?

J. B. H. Waring, M.D., Wilmington, Ohio.

Answer.—The N. F. syrup of calcium lactophosphate is a fairly pleasant preparation. Its average dose of 10 cc. represents, however, only 0.26 Gm. of calcium phosphate, which is a rather small dose. It is rather difficult to get a concentrated liquid preparation that will yield an adequate dose of calcium in palatable form. Manufacturers have placed on the market a granular effervescent calcium lactate, a dose which, added to water, is almost as palatable as the official solution of magnesium citrate.

THE QUININE AND UREA HYDROCHLORIDE INJECTION TREATMENT OF HEMORRHOIDS

To the Editor:—Please give me in detail the technic of the injection treatment of hemorrhoids with quinine and urea hydrochloride. Please omit name.

M.D., Ohio.

Answer.—This method is suitable for internal hemorrhoids that protrude or bleed. It is not suitable for hemorrhoids that are external, strangulated or inflamed. An anesthetic is not necessary. A 5 per cent solution of quinine and urea hydrochloride is used. The hemorrhoids are first brought into view by means of a rectal speculum, after which the solution is injected well into the center of each hemorrhoid. A 5 cc. glass syringe with a 2 to 3 inch steel needle will be found suitable for this purpose. From 5 to 25 minims of the solution should be injected into each hemorrrhoid, depending on its size. From two to four hemorrhoids may be injected at one treatment and the injections should be repeated at intervals of from five to seven days until there are no more uninjected masses. Several injections of each hemorrhoid may be necessary before this occurs. There is usually some pain after each treatment; this lasts only a few minutes, however, after which there is complete regional anesthesia. Sloughing is not likely to occur if the injection is made with surgical cleanliness, if it is done slowly, if it is made well into the hemorrhoid, and if it is discontinued when there is mild blanching.

Besides the syringe and needle and speculum, the instruments needed are a good light, preferably an electric headlight; a pair of long forceps for sponging, and a clamp in case of unusual bleeding.

SENILE VAGINITIS WITH ATRESIA

To the Editor:—I wish to submit to you an interesting clinical case—an unusual case of urinary difficulty: A woman, aged 74, had two children, the last one thirty-eight years ago. There was no difficulty in the labors, nor has she had any vaginal inflammatory disturbance or infection. The blood pressure is 170. She complained of the time required to pass urine. There was no pain or frequency. The urine was normal as to amount and chemical content. Examination revealed the labia completely closed over the vaginal orifice; only one labium could be detected. There was no line of scar tissue or place of union. Piercing the right labium, about an inch below the meatus, was a small opening which admitted a small probe. The clitoris, urinary orifice and vagina were completely hidden. The urine passed into the vagina and leaked out the small hole. I dilated this opening and the patient obtained marked relief. At a later date, under local anesthesia, I slit the occluding membrane, exsected part of it, exposed the clitoris, urethra and vagina, and thereby cured the condition. I have not been able to conjecture why the labia should so completely occlude the vagina and urethra. It is an acquired condition of rather long standing.

M.D., California.

Answer.—The most likely cause of the agglutination of the labia in this case is senile vaginitis. The vaginitis over a period of many years produced not only a contraction of the vagina, which is almost certainly present in this patient, but also the more unusual, nearly complete atresia of the introitus and labial opening.

TREATMENT OF HYPERESTHETIC RHINITIS

To the Editor:—Recently I have had some unusual cases which are not quite clear to me. The patient presents himself complaining of cold in the head, sneezing, and marked watery nasal discharge. The trouble arises without provocation, and affects adults and the young alike. The appearance of the patient suggests the usual picture of a severe coryza, while the intranasal examination presents the typical observations in hayfever. The secretion does not become mucopurulent despite the fact that the patient's trouble continues a progressive course. Some of the patients note an improvement during the hot summer months; others experience the opposite. On further examination I have not been able to find any associated pathologic condition except in one case which was complicated by the presence of a polyp. The prolonged turgescence of the turbinals, together with the profuse and persistent watery discharge, suggests some vasomotor discharge. Then, too, the various vasoconstrictors seem to have little or no effect on the turbinals. I have tried epinephrine and ephedrine. Any information pertaining to the diagnosis and treatment of these cases will be greatly appreciated. Please omit name.

M.D., Illinois.

Answer.—The description of this condition suggests hyperesthetic rhinitis, characterized by persistent so-called head colds, with the sneezing and thin serous secretion. The condition usually persists throughout the year but changes in severity at various times. The exact etiology cannot be determined in every case, but as a rule the condition is due to some protein sensitization. Among the most common substances that are causative factors are orris root (often the component of the various face powders), chicken feathers (often used in pillows), various foods, and bacteria. The seasonal types, such as hayfever and the so-called rose fever are due to toxalbumin of the pollen of certain plants, such as the ragweed, and of certain

grasses, such as timothy, red top and clover. In order to make a definite diagnosis, careful and complete protein sensitization tests, including such substances as the dander of horses, cats and dogs, which is often a definite etiologic factor, should be made.

The presence of polyps is usually an indication of a hyperplastic ethmoiditis, but even when absent the symptoms of the hyperplastic rhinitis may likewise be due to such hyperplastic ethmoiditis. The treatment of hyperplastic rhinitis depends on the cause found on examination, especially that of the various proteins mentioned. The elimination of the guilty factors from the environment or food, the desensitization with increasing amounts of extracts made from each protein, and the local treatment of the nose with astringents such as epinephrine and ephedrine and the use of oil, such as liquid petrolatum, often give considerable relief. Application directly to the middle meatus of trichloracetic acid is often beneficial. Internally the use of calcium lactate in rather large doses, 10 or 15 grains (0.65 or 1 Gm.) four times a day, often acts as a powerful sedative. As a last resort, in those cases in which all treatment fails, and in which rhinoscopy shows hyperplastic changes in the mucosa of the middle meatus, or roentgenograms demonstrate a thickening of the mucosa of the ethmoid cells, it may be necessary to operate by opening the anterior or possibly also the posterior ethmoidal cells.

ACID-PRODUCING FRUITS AND VEGETABLES

To the Editor:—Would you kindly furnish me with a list of those acid fruits and vegetables which, after assimilation, produce salts that are alkaline in reaction and those which are acid.

H. M. Weber, M.D., Lakehurst, N. J.

ANSWER.—All the tables which are available in regard to the fruits and vegetables show that practically all fruits and vegetables after assimilation produce alkaline salts. The exceptions are corn, cranberries and prunes.

TANNIC ACID TREATMENT OF BURNS

To the Editor:—Is tannic acid commonly used in treating burns? If so used, are there any possible bad effects that might follow? The simplicity of treatment appeals to one because of the fact that one can always be prepared for treatment of severe burns by this method.

M.D., Iowa.

ANSWER.—The probable reason the tannic acid dressing is not more generally employed in the treatment of burns is that its advocacy is recent. It has, however, created sufficient favorable comment to be worthy of confidence.

WIDAL'S TEST IN TYPHOID

To the Editor:—Kindly inform me as to the significance of Widal's test in typhoid. Does it represent a sign of defense or does it mean that the organism is infected? Please omit my name.

M.D., Mexico.

ANSWER.—The agglutination of typhoid bacilli by the blood serum of a typhoid patient, commonly known as the Widal test, means in the first place that the patient in question has been infected with typhoid bacilli and that he has reacted to this infection by the new production of specific agglutinins and other specific antibodies. Consequently the production of agglutinins may be regarded also as an indication of a defensive reaction on the part of the infected body.

HYPODERMOCLYSIS IN WOMEN

To the Editor:—Am I right or wrong in disapproving of rapid, bulky retromammary hypodermoclysis in the case of women? Isn't there a possibility of injuring the gland tissue by direct pressure, and also by pressure on the blood supply? Patients say the breasts are painful for several days afterward. Isn't that enough reason to discard its use? Has it any real advantage over the rectal drip, or slow hypodermoclysis in a less sensitive area, except that of convenience to the administrator? Aren't physicians and nurses sometimes prone to forget that patients pay them to eliminate and alleviate pain, not cause it unnecessarily? If patients were not in a helpless condition at the time, and if they knew that the solution could be given otherwise, don't you think the doctors would change the site of administration or else the patients would change doctors?

M.D., Massachusetts.

ANSWER.—Rapid retromammary hypodermoclysis is unduly painful and may be harmful. Saline solution administered through sharp needles of small caliber causes little pain when given in the loose areolar tissues of the axillary or anterior axillary line. The solution should be introduced slowly and in amounts insufficient to produce pain from tension. The rectal drip is helpful but is not well retained by most patients if used over a period of more than a day, or two days at the most. Even under favorable conditions, relatively much less fluid is absorbed in this way. Seriously ill patients receive sufficient relief from slaking of thirst and decreased toxemia to more than compensate for the distress of judiciously administered hypodermoclysis.

DANGERS OF CEMENTS CONTAINING BENZENE

To the Editor:—I recently have treated a case of what I believed aplastic anemia from benzene poisoning, contracted while working with a rubber cement used to stick linings in shoes. I had no way of finding out directly what this rubber cement is commercially, so I am trying to find out the possibilities in this direction, that is, by learning the names of the commercial preparation manufactured and sold to shoe factories for this purpose. I am wondering whether you could help me in that direction. I might say that I wrote to Greenburg for this information, but all he did was to send to me his reprint from the Treasury Department and ignored the thing I was after; that is, the commercial name, manufacturer, etc., of rubber cements used in the shoe factories. It may be, of course, that you have at hand the composition of some of these cements.

L. S. LUTON, M.D., St. Louis.

ANSWER.—Below is furnished a partial list of manufacturers supplying adhesive materials for use in the shoe trade:

The National Adhesive Products Corporation, 155 North Clark Street, Chicago.
The Packard Manufacturing Company, Auburn, Maine.
The Hazen-Brown Company, 100 South Street, Boston.
The K. J. Quinn & Co., Inc., 481 Chelsea, Boston.
United Shoe Machinery Corporation, 205 Lincoln Street, Boston.
Averell Thayer Company, Brockton, Mass.
Henry C. Hatch, Brockton, Mass.
The Dewey and Almy Chemical Company, Cambridge, Mass.
The A. B. & S. Cement and Rubber Company, Haverhill, Mass.
The Parker Company, Inc., Haverhill, Mass.
Irving L. Kieth, Haverhill, Mass.
Eureka Cement Company, 2-6 Avenue S, Newark, N. J.
Bradstone Rubber Company, Woodbine, N. J.
Arabol Manufacturing Company, 112 East Forty-Second Street, New York.
Montgomery Brothers, Inc., Twenty-second Street and Penrose Terrace, Philadelphia.
Perfectfix Rubber Company, Inc., Alvis, Wis.

It is not known that all or any of these manufacturers manufacture benzene-containing cements.

The harmful substances in cements widely used in the shoe and rubber industry are: benzine, benzene, solvent naphtha, carbon bisulphide, carbon tetrachloride and turpentines. Of these, benzene probably is the most dangerous. The state department of health of Ohio is said to have found in the millinery industry cements containing as high as 92 per cent of benzene by volume.

Reference should be made to the publication "Poisoning by Benzol Carbon Tetrachloride Cement," prepared by the late Dr. E. B. Starr, and published in the *Journal of Industrial Hygiene* **4**:202 (Sept.) 1922. In this work two analyses of benzene-containing cement are included, and are here quoted:

	Sample A, Per Cent	Sample B, Per Cent
Residue on evaporation, largely rubber...	3.60	3.11
Solvent:		
Carbon tetrachloride (CCl_4).....	70.0*	66.0*
Benzene (benzol, C_6H_6).....	30.0*	34.0*
Carbon bisulphide (CS_2).....	....	0.05

* Per cent by volume.

UNGUENTUM MAZON

To the Editor:—I am writing you at this time in reference to the chemical formula for "Unguentum Mazon" as manufactured by the Belmont Laboratories, Inc., Philadelphia. I am desirous of securing this information. Kindly omit name.

M.D., Washington, D. C.

ANSWER.—The A. M. A. Chemical Laboratory has no information in its files on this product, nor has it been submitted to the Council on Pharmacy and Chemistry. An inquiry was sent to the Belmont Laboratories, Inc., to ascertain whether or not the composition of Mazon and Mazon Soap and Ointment was secret, and if not, what were the formulas. The Belmont Laboratories, Inc., replied as follows:

We very much regret our inability to comply with the request contained in your letter dated September 21 with reference to Mazon and Mazon Soap for the reason that the composition of both of these products is secret.

It seems hard to believe that there are still pharmaceutic houses that will endeavor to exploit products of secret composition to the medical profession. The physicians who are asked to buy such products should refer to the detail men the paragraph in the Code of Ethics of the A. M. A., which states that

. . . it is equally unethical to prescribe or dispense secret medicines or other secret remedial agents, or manufacture or promote their use in any way.

Medical Education, Registration and Hospital Service

COMING EXAMINATIONS

ARKANSAS—Eclectic: Little Rock, Nov. 13-14. Sec., Dr. C. E. Laws, 803½ Garrison Ave., Fort Smith, Ark.

ARKANSAS—Homeo: Place not decided, Nov. 13. Sec., Dr. A. A. Pringle, Eureka Springs, Ark.

ARKANSAS—Regular: Little Rock, Nov. 13-14. Sec., Dr. J. W. Walker, Fayetteville, Ark.

CONNECTICUT—Homeopathic: New Haven, Nov. 13. Sec. Dr. E. C. M. Hall, 82 Grand Ave., New Haven, Conn.

CONNECTICUT—Regular: Hartford, Nov. 13-14. Sec., Dr. Robert L. Rowley, 79 Elm St., Hartford, Conn.

FLORIDA: Marianna, Nov. 12-13. Sec., Dr. W. M. Rowlett, 812 Citizens Bank Bldg., Tampa, Fla.

LOUISIANA—Homeopathic: New Orleans, Nov. 6. Sec., Dr. F. H. Hardenstein, 1714 Pere Marquette Bldg., New Orleans, La.

MAINE: Portland, Nov. 13-14. Sec., Dr. Adam P. Leighton, Jr., 192 State St., Portland, Me.

MASSACHUSETTS: Boston, Nov. 12-14. Sec., Dr. Frank M. Vaughan, 144 State House, Boston, Mass.

MISSOURI: St. Louis, Oct. 23-25. Address — Dr. Ross Hopkins, Licensure, Jefferson City, Mo.

NEBRASKA—REGULAR: Lincoln, Nov. 26-28. Dir., Mrs. Clark Perkins, Bureau of Examining Boards, Dept. of Public Welfare, Lincoln, Neb.

NEVADA: Carson City, Nov. 5-7. Sec., Dr. Edw. E. Hamer, Carson City, Nevada.

PHILIPPINE ISLANDS: Manila, Nov. 13. Sec., Dr. Jose V. Gloria, 341 Ronquillo Station, Cruz, Manila, Philippine Islands.

SOUTH CAROLINA: Columbia, Nov. 13. Sec., Dr. A. Earle Boozer, 505 Saluda Ave., Columbia, S. C.

TEXAS: Ft. Worth, Nov. 20-22. Sec., Dr. T. J. Crowe, 918 Mercantile Bank Bldg., Dallas, Texas.

VIRGINIA: Richmond, Dec. 4-7. Sec., Dr. J. W. Preston, State Bd. of Med. Examiners, 720 Shenandoah Life Bldg., Roanoke, Va.

WEST VIRGINIA: Morgantown, Nov. 27. Sec., Dr. W. T. Henshaw, State Health Department, Charleston, W. Va.

New York January Reciprocity Report

Mr. H. J. Hamilton, chief of the Department of Education of New York State, reports 84 physicians licensed by endorsement of credentials in the period from Jan. 1 to April 14, 1928. The following colleges were represented:

College	Year Grad.	Endorsement from
University of Arkansas School of Medicine	(1917)	Arkansas
University of California Medical School	(1923), (1924)	California
Georgetown University School of Med	(1921) Pa., (1923)	Porto Rico
American Medical Missionary College	(1906)	Ohio
Bennett College of Eclectic Medicine and Surgery	(1900)	Illinois
Northwestern University Medical School	(1911)	Illinois
Rush Medical College	(1910), (1922) Illinois; (1927-2)	N. B. M. Ex.
University of Illinois College of Medicine	(1925)	Indiana
Indiana University School of Medicine	(1924)	Indiana
State University of Iowa College of Medicine	(1909)	Iowa
University of Louisville School of Medicine	(1925)	Indiana
Tulane Univ. of Louisiana School of Med	(1916), (1921)	Louisiana
Johns Hopkins Univ. School of Med	(1918), (1924), (1926)	N. B. M. Ex.
Harvard University Med. School	(1905) Calif., (1913) (1922) Mass., (1924), (1925), (1926, 4)	R. Island N. B. M. Ex., (1915) Connecticut
Tufts College Medical School	(1913), (1922)	Mass.
Detroit College of Medicine and Surgery	(1921)	Michigan
University of Minnesota Medical School	(1920), (1921)	Minnesota
Washington University School of Medicine	(1905)	Illinois
Albany Medical College	(1925)	N. B. M. Ex.
Columbia University College of Phys. and Surgs. (1925), (1926) (2)	(1926)	Virginia N. B. M. Ex.
Cornell University Medical College	(1925, 2)	N. B. M. Ex.
Long Island College Hospital	(1903)	Illinois
Syracuse University College of Medicine	(1925)	N. B. M. Ex.
University and Bellevue Hospital Medical College	(1917)	Porto Rico
Eclectic Medical College, Cincinnati	(1926)	Ohio
Ohio State University College of Medicine	(1925) (2)	Ohio
Western Reserve University School of Medicine	(1921)	Ohio
University of Oregon Medical School	(1916)	Oregon
Hahnemann Medical College and Hospital of Philadelphia, Homeopathic	(1901) Penna., (1907)	Dist. Colum.
Jefferson Medical College of Philadelphia (1919) Alabama, (1924) Ohio	(1904)	N. Carolina
Medico-Chirurgical College of Philadelphia	(1893)	Diploma
University of Pennsylvania School of Medicine (1906) Ohio, (1908) Mass., (1909) Utah, (1925) (1926)	(1895)	Penna. N. B. M. Ex.
University of Pittsburgh Sch. of Med	(1914) Conn., (1920)	Penna.
Woman's Medical College of Pennsylvania	(1905), (1914)	Penna.
University of Tennessee College of Medicine	(1918)	Tennessee
Baylor University College of Medicine	(1922)	Texas
University of Vermont College of Med	(1894) Mass., (1915)	Vermont
McGill University Faculty of Med	(1905) Canada, (1925)	Ohio
University of Toronto Faculty of Med	(1926) New Jersey,	N. B. M. Ex.
University of Wurzburg, Germany	(1920)	New Jersey
Donskey University, Russia	(1921)	New Jersey
Dragomanov Institute, Russia	(1922)	New Jersey
University of Barcelona, Spain	(1874)*	Porto Rico
University of Geneva, Switzerland	(1921)	Diploma
Osteopaths	3	New Jersey

* Verification of graduation in process.

Book Notices

PRÉCIS DE DERMATOLOGIE. Par J. Darier, médecin honoraire de l'Hôpital Saint-Louis. Fourth edition. Cloth. Price, 100 francs. Pp. 1102, with 220 illustrations. Paris: Masson & Cie, 1928.

The appearance of a new edition of this work is always an event in the dermatologic life of the reviewer, as copies of successive editions become dog eared by constant use. The book is so convenient in size, the style so simple and clear, the arrangement so logical and the work so concise and at the same time so comprehensive that it is likely to become the daily diet of any dermatologist who familiarizes himself with it. In the preface the author modestly disclaims any intention of making the "Précis" anything more than the name implies—a book for the medical student and the general practitioner; nevertheless, he has succeeded in creating a work that is invaluable to the dermatologist. The author rather apologetically admits the absence of a bibliography, but no apology is necessary at this time when all of the dermatologic and many of the medical publications carry detailed abstracts of the current journals. The book has been enlarged by 116 pages, but it is still small enough to be tucked away into a bag or even into an overcoat pocket. Much new material has been added and chapter XXIII, "Aperçu d'étiologie générale," should be read by every dermatologist, both for the information it contains and as an example of how clearly and succinctly complicated subjects such as anaphylaxis, allergy, idiosyncrasy, sensitization, allergins and desensitization can be expounded by a clear-thinking and judicially minded man. Chapter XXXI, on virus filtrants, is a masterly exposition of the latest advances in this most interesting field of dermatology. Chapter XXXII, on "Lymphadénies," treats a subject that is more and more demanding clarification, and Darier contributes much to that end. Many new illustrations have been added and the best of the old ones have been retained. In reading the work one is impressed by the ease with which the author is able to give his opinion on all subjects without any display of dogmatism. The publishers are to be complimented on their cooperation with and support of the distinguished French dermatologist in this revision of a most valuable small contemporary dermatologic textbook.

SURGICAL ANATOMY. By Grant Massie, M.B., M.S., F.R.C.S., Senior Demonstrator of Anatomy and Surgical Tutor, Guy's Hospital Medical School. Cloth. Price, $5.50. Pp. 413, with 121 illustrations. Philadelphia: Lea & Febiger, 1928.

The author has made an attempt to present surgical anatomy together with its clinical application. The anatomic description of the various regions of the body is followed by a discussion of the operative technic of commonly performed operations. The text is clear and interesting. There are a number of admirable drawings, some in colors. The book offers excellent instruction for the student and much to interest the older practitioner.

ATLAS DER BLUTKRANKHEITEN. Von Dr. Karl Schleip, und Dr. Albert Alder, Privatdozent für innere Medizin an der Universität Zurich. Second edition. Cloth. Price, 62 marks. Pp. 175, with 108 illustrations. Berlin: Urban & Schwarzenberg, 1928.

The new edition contains almost twice as many illustrations as the old. The text is delightfully short and consists chiefly of brief remarks pertaining to the illustrations. The reproductions from drawings in colors are the main aim and content of the book. About half of them are very good as far as the present technic goes. However, many will disagree with the authors' claim that even the illustrations of the first edition—venerable as they are—have not been surpassed by any other book. Another parental exaggeration is the claim that the figures show everything to be seen by the microscope. This is true of few, if any of them, except of course in the case of some very simple structures. Some of the illustrations give an enormously better impression than the microscope—for instance, the eosinophilic granules on plate 83 and elsewhere. Many other plates either fail to give the structure of the nuclei (for instance, plate 84) or show it as it impressed the painter or as the printer changed it (plate 85), but certainly not as the hematologists see it in the microscope. Nevertheless the book will be useful to the beginner who wants guidance in interpreting what he sees.

PHYSIOLOGY AND BIOCHEMISTRY OF BACTERIA. Volume I—Growth Phases; Composition, and Biophysical Chemistry of Bacteria and Their Environment; and Energetics. By R. E. Buchanan, Ph.D., Dean of the Graduate School, Iowa State College, and Ellis I. Fulmer, Ph.D., Professor of Biophysical Chemistry, Department of Chemistry, Iowa State College. Cloth. Price, $7.50. Pp. 516, with 78 illustrations. Baltimore: Williams & Wilkins Company, 1928.

This is evidently the first volume of a series of books dealing with biochemistry of bacterial cells. It contains a discussion of growth phases, the composition and physicochemistry of bacteria, and energetics. The time has come when bacteriologists must be, to a certain extent, physical chemists, and the authors have prepared a book of great value to workers in this field. Such live subjects as the application of Donnan's equilibrium are fully discussed, and much space is devoted to energy relationships. A good deal of the material is necessarily elementary in character but none the less valuable to the bacteriologist. The bibliography is extensive and a valuable part of the book. We shall look with pleasure for the publication of further volumes.

MANUEL DE BACTÉRIOLOGIE MÉDICALE. Par André Philibert, professeur agrégé de bactériologie. Cloth. Price, 55 francs. Pp. 551, with 21 illustrations. Paris: Masson & Cie, 1928.

This is an account of bacteriologic methods for the examination of pathologic material and intended for medical students and laboratory workers. Much of the book consists of descriptions of the various pathogenic bacteria. There are about twenty colored plates. In general, the material is similar to that found in American books of like character.

DIABETIC MANUAL FOR PATIENTS. By Henry J. John, M.A., M.D., F.A.C.P., Director of the Diabetic Department and Laboratories of the Cleveland Clinic. Cloth. Price, $1.75. Pp. 202, with 42 illustrations. St. Louis: C. V. Mosby Company, 1928.

In this book, as in many others recently issued, there is a good discussion of the treatment and care of the diabetic patient. Perhaps the charts are more interesting or more instructive than those usually seen.

KURZES HANDBUCH DER GESAMTEN RÖNTGENDIAGNOSTIK UND THERAPIE MIT EINEM ANHANG ÜBER DIE THERAPEUTISCHE VERWENDUNG RADIOAKTIVER SUBSTANZEN. Herausgegeben von Gerd Kohlmann. Paper. Price, 53 marks. Pp. 917, with 781 illustrations. Berlin: S. Karger, 1928.

This is a compilation of all the methods employed in roentgen diagnosis and radiotherapy and of the results obtained. The editor followed the plan, now so popular, of having each chapter written by an author who is known to have paid special attention to the topic under discussion. The introductory chapters deal with the physical principles guiding the production of x-rays and their application for practical purposes. A separate chapter is devoted to the details of producing and conserving the photographic x-ray plates. The stereoscopic methods employed in roentgen diagnosis are detailed and criticized. These technical instructions are followed by a presentation of the possibilities of x-ray diagnosis arranged according to the various parts of the human anatomy. Of especial interest to the surgeon will be the chapter on the subphrenic abscess and the roentgenology of stomachs operated on previously. Of the more recent developments in x-ray diagnosis, the employment of pneumoperitoneum and the exploration of the intracranial spaces and the spinal dural space by means of gaseous and liquid contrast mediums find detailed and instructive discussion, including an exposition of the possible dangers of these methods and suggestions as to their avoidance. The therapeutic part of the textbook begins with an explanation of the biologic action of x-rays and a chapter dealing with the principles of measuring dosage and the appliances used for this purpose. The protective measures to prevent untoward harm by irradiating and the treatment of established disturbances are enumerated and discussed. This is followed by chapters dealing with all the pathologic occurrences in which roentgenotherapy may be employed. A supplementary chapter deals with the theory of the action of radioactive substances and the technic of administration. The employment of radioactive mineral waters is qualified as to the efficacy of certain waters, and indications and results are recounted. The illustrations are of a high standard. For the quick orientation of the readers, a complete index of topics and authors is appended

DIATHERMY: ITS PRODUCTION AND USES IN MEDICINE AND SURGERY. By Elkin P. Cumberbatch, M.A., B.M., D.M.R.E., Medical Officer in Charge, Electrical Department, St. Bartholomew's Hospital. Second edition. Cloth. Price, $7. Pp. 332, with 87 illustrations. St. Louis: C. V. Mosby Company, 1928.

The author's style is straightforward and the subject matter is clear and concisely considered. He has devoted considerable space to the physical principles on which high frequency currents are produced. This is a valuable contribution. His description of the diathermy machine is extensive, but unfortunately only one American machine is mentioned. The illustrations, while good, are too foreign for visual conception. The action of diathermy on the body in health as described is interesting. From the favorable results of the large number of case reports of different disease conditions, one would judge that medical diathermy was good for almost every abnormal condition. The application of surgical diathermy to the treatment of neoplasms both benign and malignant is described in accurate detail, but the instruments used to perform the various procedures are limited to English design and manufacture. Little credit has been given American pioneers in diathermy in the many references cited.

ABHANDLUNGEN AUS DEM GESAMTGEBIETE DER HYGIENE. Herausgegeben von Dr. R. Grassberger, o. ö. Professor der Hygiene in Wien. Heft 1: Zur Frage des Chlorens und Entchlorens beim Entkeimen des Trinkwassers. I. Über wirklich freies und scheinbar freies wirksames Chlor in Lösungen und dessen Nachweis. Von Dr. Karl Bauer, Dr. Franz Noziczka, und Dr. Otto Stüber. Paper. Price, 2.40 marks. Pp. 31. Leipzig: Franz Deuticke, 1928.

This monograph consists of a discussion of methods of analysis of free and combined chlorine in drinking waters. The author believes that chlorine is found in three types of combination; strongly bound chlorine, apparently free chlorine, and what is usually called free chlorine. Further discussion of chlorine in drinking water is to be given in future publications.

Books Received

Books received are acknowledged in this column, and such acknowledgment must be regarded as a sufficient return for the courtesy of the sender. Selections will be made for more extensive review in the interests of our readers and as space permits. Books listed in this department are not available for lending. Any information concerning them will be supplied on request.

A PRACTICAL MEDICAL DICTIONARY OF WORDS USED IN MEDICINE WITH THEIR DERIVATION AND PRONUNCIATION, INCLUDING DENTAL, VETERINARY, CHEMICAL, BOTANICAL, ELECTRICAL, LIFE INSURANCE AND OTHER SPECIAL TERMS: Anatomical Tables of the Titles in General Use, and Those Sanctioned by the Basle Anatomical Convention; Pharmaceutical Preparations, Official in the U. S. and British Pharmacopœias and Contained in the National Formulary, and Comprehensive Lists of Synonyms. By Thomas Lathrop Stedman, A.M., M.D. Tenth edition. Leather. Price, $7.50. Pp. 1194, with illustrations. New York: William Wood & Company, 1928.

Comprehensive dictionary containing much that is not medical and not consistent in spelling forms.

DISEASES OF INFANTS AND CHILDREN. By Henry Dwight Chapin, A.M., M.D., Medical Director of the Speedwell Society, and Lawrence Thomas Royster, M.D., Professor of Pediatrics and Head of the Pediatric Department of the University of Virginia. Sixth edition. Cloth. Price, $7.50. Pp. 675, with illustrations. New York: William Wood & Company, 1928.

New edition brought up to date by reference to recent periodical literature.

SURGICAL DIAGNOSIS IN TABULAR OUTLINE for STUDENTS AND PHYSICIANS. By Dr. A. J. Cemach. Translated by Edward L. Bortz, M.D., Associate in Medicine, The Lankenau Hospital, Philadelphia. Introductory note by John B. Deaver, M.D. Cloth. Price, $12 net. 109 tabular forms and 129 plates, with 548 subjects. Philadelphia: F. A. Davis Company, 1928.

Translation of a convenient guide to surgical knowledge in outline form.

REQUISITES AND METHODS IN SURGERY. For the Use of Students, House Surgeons and General Practitioners. By Charles W. Cathcart, C.B.E., M.A., M.B., Consulting Surgeon, Royal Infirmary, Edinburgh, and J. N. Jackson Hartley, O.B.E., M.B., F.R.C.S, Surgeon, Cumberland Infirmary, Carlisle. Cloth. Price, 12/6 net. Pp. 476, with 244 illustrations. Edinburgh: Oliver & Boyd, 1928.

Brief guide to principles of surgical practice.

HANDBOOK OF PHARMACOGNOSY. By Otto A. Wall, M.D., Ph.G. Revised by Leo Suppan, Ph.G., B.Sc., Professor of Botany and Pharmacognosy in the St. Louis College of Pharmacy. Fifth edition. Cloth. Price, $5. Pp. 472, with 407 illustrations. St. Louis: C. V. Mosby Company, 1928.

New edition of popular volume for physicians especially interested in technical aspects of pharmacy.

DISEASES OF THE EAR, NOSE AND THROAT, MEDICAL AND SURGICAL. By Wendell Christopher Phillips, M.D., Surgeon to the Manhattan Eye, Ear and Throat Hospital. Seventh edition. Cloth. Price, $9 net. Pp. 922, with 615 illustrations. Philadelphia: F. A. Davis Company, 1928.

New edition of an exceedingly popular textbook of otolaryngology.

DISEASES OF THE MOUTH. By Sterling V. Mead, D.D.S., Professor of Oral Surgery and Diseases of the Mouth, Georgetown Dental School. Third edition. Cloth. Price, $10. Pp. 727, with 336 illustrations. St. Louis: C. V. Mosby Company, 1928.

Stomatology considered largely from the dental point of view.

CLINICAL ELECTROCARDIOGRAPHY. By Sir Thomas Lewis, M.D., F.R.S., D.Sc., Honorary Consulting Physician to the Ministry of Pensions. Fourth edition. Cloth. Price, 8/6 net. Pp. 128, with 107 illustrations. London: Shaw & Sons, Ltd., 1928.

New edition of a popular and fundamental monograph.

RECENT ADVANCES IN SURGERY. By W. Heneage Ogilvie, M.A., M.D., M.Ch., Assistant Surgeon, Guy's Hospital. Cloth. Price, $3.50. Pp. 461, with 108 illustrations. Philadelphia: P. Blakiston's Son & Company, 1928.

Another addition to this series of progress books.

THE PELTZER CASE. By Gérard Harry. Cloth. Price, $3. Pp. 243, with illustrations. New York: Charles Scribner's Sons, 1928.

Story of a famous crime rivaling the fanciful in interest.

VACCINATION. Report of the Committee on (i) matters relating to the preparation, testing and standardization of vaccine lymph; (ii) the practical methods which are available in the light of modern knowledge to diminish or remove any risks which may result from vaccination; (iii) the methods of vaccination which are most appropriate to give protection against risk of smallpox infection in epidemic and non-epidemic periods. Ministry of Health. Paper. Price, 7s. net. Pp. 324, with illustrations. London: His Majesty's Stationery Office, 1928.

A TREATISE ON PHARMACEUTICAL CHEMISTRY EMBRACING CERTAIN SPECIAL TOPICS OF ANALYTICAL, ORGANIC, AND PHYSICAL CHEMISTRY AS THEY ARE RELATED TO PHARMACY. By John C. Krantz, Jr., Ph.D., Director of Pharmaceutical Research, Sharp and Dohme. Cloth. Price, $3.50. Pp. 282, with 25 illustrations. St. Louis: C. V. Mosby Company, 1928.

A TEXT-BOOK OF FRACTURES AND DISLOCATIONS COVERING THEIR PATHOLOGY, DIAGNOSIS AND TREATMENT. By Kellogg Speed, S.B., M.D., F.A.C.S., Associate Professor of Clinical Surgery, Rush Medical College of the University of Chicago. Second edition. Cloth. Price, $11 net. Pp. 952, with 987 illustrations. Philadelphia: Lea & Febiger, 1928.

HANDBUCH DER INNEREN SEKRETION. Eine umfassende Darstellung der Anatomie, Physiologie und Pathologie der endokrinen Drüsen. Herausgegeben von Dr. Max Hirsch. Lieferung 4. Band II. Paper. Price, 22 marks. Pp. 927-1142, with 22 illustrations. Leipzig: Curt Habitzsch, 1928.

UNIVERSITY OF IOWA STUDIES IN PSYCHOLOGY, No. XI. Edited by Christian A. Ruckmick. Psychological Monographs, No. 176. Edited by Raymond Dodge, and others. Paper. Pp. 234, with illustrations. Princeton: Psychological Review Company, 1928.

A LABORATORY MANUAL OF PHYSIOLOGICAL CHEMISTRY. By D. Wright Wilson, Benjamin Rush Professor of Physiological Chemistry, University of Pennsylvania. Cloth. Price, $3.50. Pp. 272. Baltimore: Williams & Wilkins Company, 1928.

SEVENTY-NINTH REGISTRATION REPORT OF THE STATE OF CONNECTICUT OF BIRTHS, MARRIAGES, DIVORCES AND DEATHS FOR THE YEAR ENDED DECEMBER 31, 1926. Issued by the State Department of Health. Cloth. Pp. 271. Hartford, 1928.

SEVENTY-THIRD REGISTRATION REPORT OF THE STATE OF CONNECTICUT OF BIRTHS, MARRIAGES, DIVORCES AND DEATHS FOR THE YEAR ENDED DECEMBER 31, 1920. Issued by the State Department of Health. Cloth. Pp. 247. Hartford, 1927.

THE TECHNOLOGY OF LOW TEMPERATURE CARBONIZATION. By Frank M. Gentry. Cloth. Price, $7.50. Pp. 399, with 80 illustrations. Baltimore: Williams & Wilkins Company, 1928.

THE ARMY MEDICAL BULLETIN NUMBER 22. 1928. Tables of Organization. Medical Department. Paper. Pp. 65. Carlisle Barracks, Pa.: Medical Field Service School, 1928.

2,896 FORMULAS FOR PHARMACISTS. The D—C, Druggists Circular Formulary. Cloth. Price, $2. After Dec. 1st. $3. Pp. 387. New York: The Druggists Circular, Inc., 1928.

Medicolegal

Osteoarthritis Activated by Accident Compensable

(Dewees v. Day and Zimmerman, Inc., et al. (Pa.), 140 Atl. 345)

The plaintiff, in the course of his employment, sustained a scalp wound and fractures of the bodies of the third, fourth and sixth cervical vertebrae. In eighteen days he was discharged from the hospital, and, believing himself on the way to complete recovery, he settled with and released the defendants. Soon afterward, "an inflammation of the joints and membranes, known as osteoarthritis, actively developed in the location of the spinal injury and resulted in total disability." The workmen's compensation board then reopened the case and awarded further compensation. The court of common pleas sustained the award, and the employer and the insurance carrier appealed to the supreme court of Pennsylvania. The plaintiff contended that, although he seemed to be in good health before the accident and able to work, he had a latent osteoarthritis, and that the accident rendered the disease active and was therefore the superinducing cause of his disability. If this contention was true, the award was correctly made. Since the employer and the insurance carrier denied the prior existence of the osteoarthritis or that it was aggravated by the accident, the burden of proof as to both rested on the plaintiff. The testimony of the medical examiner of the compensation board was competent evidence to show that the claimant had a preexisting physical condition which was aggravated by the accident. Another physician testified, "I think the accident was the exciting cause of his condition," and, further, "I think the injury is the exciting cause. . . ." The court pointed out that a necessary fact depending on expert evidence must be supported at least by the definite opinion of the expert, but held that the words "I think" are equivalent to "I believe," and when used by an expert amount to an expression of professional opinion. Moreover, the fact that the plaintiff, 64 years old and apparently in good health, within a short time after the injury became so seriously crippled at the seat of the injury as to be totally disabled, tended to support his claim and might properly be considered in weighing the evidence. The judgment of the court below sustaining the award was affirmed.

"Good Health" Defined

(Woodland v. Liberty Life Ins. Co. (Mich.), 217 N. W. 796)

The plaintiff's husband was insured by the defendant, the Liberty Life Insurance Company. His policy lapsed, March 22, 1924. The insured applied for reinstatement, April 1. The application, which was approved by the company, April 4, specified that the policy should not be renewed or go into effect unless it was approved by the company while the insured continued in good health. The insured died, April 6, and the plaintiff, as beneficiary under the policy, brought this action. The jury rendered a verdict in her favor, and the insurer appealed to the supreme court of Michigan. The plaintiff testified that on April 4 her husband came home from work about 10 o'clock, because he was sick. She called a physician, who made three visits that day, diagnosing the case as lobar pneumonia around noon, when the patient had a temperature of 107. There was testimony, however, to the effect that the deceased was compelled by illness to leave his work on April 3 and that he called at his physician's office on that day and obtained a prescription for a cough or cold. The physician whom he consulted on April 3 testified that the deceased was not then a very sick man. Death occurred from lobar pneumonia. The insurer claimed that the undisputed facts showed that the insured was not in "good health" at the time of the approval of the policy, sometime after 2 o'clock, April 4. The plaintiff claimed that that question had properly been left to the jury by the trial judge. The supreme court pointed out that the expression "good health" as used incident to insurance contracts is comparative and has a more or less flexible meaning. "Sound health," the court said, had previously been defined by it as a state of health free from any disease or ailment that affects the general soundness and healthfulness of the system, seriously, not a mere temporary indisposition which does not tend to

weaken or undermine the constitution of the assured. The definition had later been approved by the court as a definition of "good health." Testing the case by the foregoing or any other fair and reasonable definition of the expression "good health," it was obvious that by noon, April 4, the insured was not in "good health" but was seriously ill and continued in that condition until his death two days later. The trial court should have granted the defendant's motion for a judgment, notwithstanding the verdict. The judgment of the trial court was reversed and the case remanded with directions to set aside the judgment and to enter judgment for the defendant.

Roentgen-Ray Burn and Hypersensitive Skin

(Nelson v. Newell (Wis.), 217 N. W. 723)

The plaintiff was examined twice by the defendant on May 10, 1924, by the use of a fluoroscope. Ulcers developed on the back, where the fluoroscope had been used. The plaintiff sued in the circuit court of Racine County, judgment was rendered in his favor for $12,500, and the defendant appealed to the supreme court of Wisconsin. The evidence showed that the defendant, on the day named, made two fluoroscopic examinations, one in the forenoon and the other in the afternoon, applying, according to the defendant's testimony, "the usual and standard dose for the purposes of an examination." The plaintiff testified that after the second examination, while he was returning to his home, he felt an itching sensation in the small of the back and that on the fourth or fifth day thereafter the place where the roentgen ray was applied showed an area of redness and the itching continued. Seventeen days after the first examination, three roentgenograms of the patient were made by another roentgenologist, who was not informed of the examinations previously made by the defendant. The roentgen ray was at that time applied to the front of the plaintiff's body. On or about October 1, 1924, it became apparent that the plaintiff was suffering from ulcers in the region of the back to which the defendant had applied the roentgen ray, and it was undisputed that these ulcers manifested a third degree burn. The defendant's experts testified that they had never heard of itching occurring within several hours after an examination; that it occurred as a rule between ten and twelve days after the examination; and that the appearance of redness four or five days after examination was unusual. The defense was based on the theory that the plaintiff was abnormal and hypersensitive to the roentgen ray. It appeared in evidence that no method had been discovered by which it could be determined whether a given person was or was not hypersensitive. It was undisputed that cases of hypersensitiveness are extremely rare. One expert witness for the defense testified that he had made 10,000 roentgen-ray examinations of the chest and numerous other examinations of other parts of the body and had never produced a third degree burn. Another expert for the defense whose experience covered 25,000 examinations testified to the same effect. A hypothetical question to an expert for the plaintiff, including substantially all of the facts shown in the evidence, elicited the answer that he knew that the burn was caused by an excessive and improper application of the roentgen ray and that in his opinion the injury resulted therefrom. In the course of its opinion the court pointed out that the defense of abnormality and hypersensitiveness of the plaintiff has been interposed in many cases of malpractice in which it has been charged that the physician had caused the injury by the negligent use of the roentgen ray and that the defense had proved quite generally successful. The court concluded, however, that "if a verdict such as was rendered in the instant case upon the evidence adduced therein can be set aside upon the ground of a mere speculation that the subject is one who possesses a hypersensitiveness to the x-ray, then it might as well be admitted that cases of this kind cannot be successfully prosecuted." An effort was made in the course of the defense to attribute the burn to the cumulative effect of the application of the roentgen ray by the roentgenologist who examined the plaintiff seventeen days after the first application, and an expert for the defendant testified that there was a possibility of a roentgen-ray burn appearing on the back when the roentgen ray had been applied in front of the body, although ordinarily the burn would manifest itself at the point of application of the ray. That evidence and the fact that the first manifestations of the burn appeared before the second examination was made were held by the court to establish an adequate basis for the legal conclusion that the burn resulted from negligent application by the defendant. The court concluded that the damages awarded were not excessive. Judgment of the court below was affirmed.

Trauma as an Injury to Health

(Venable v. Gulf Taxi Line (W. Va.), 141 S. E. 622)

The plaintiff was injured while a passenger in the defendant's motor car. In the circuit court, Raleigh County, he obtained a verdict and judgment for $5,000. The defendant appealed to the supreme court of appeals of West Virginia. The evidence showed that the plaintiff had been bruised and one of his eyes put out, and that he had suffered great anguish and pain as a result of such injuries. A bill of particulars furnished by the plaintiff at the defendant's request showed "temporary injury to his chest by reason of being thrown violently against the front seat of the car, damages done to the left eye by pieces of glass striking it, resulting in permanent loss of vision and the removal of the eyeball, and the mental and physical pain and suffering resulting therefrom, right eye weakened and causing pain." The trial judge instructed the jury that if it should find for the plaintiff it should take into consideration all the evidence, facts and circumstances as to the health and condition of the plaintiff before the injury as compared with his then condition in consequence of his injuries, and among other things injury to the plaintiff's health. The defendant objected to the instruction given the jury to take into consideration the injury to the plaintiff's health as an element of damages, because, the defendant said, it was not fairly covered by his declaration or by his bill of particulars. The defendant claimed that there was not included in the declaration any notice of damages caused by impairment of health and that there was no evidence of impairment of health. The court concluded, however, that:

> To be bruised and maimed, to lose one's eye, and to suffer pain and anguish, as is shown to have been sustained by plaintiff in this case, as a result of the unquestionable negligence of the defendant, is to be impaired in one's health. As counsel very well argue by their reference to the definitions given in the books, health means the "state of being hale, sound or whole in body, mind or soul, well being." To have lost one eye, one could not be sound in health, nor whole in body. Such a defect would naturally impair one's usefulness, his chances of livelihood, his ability to enjoy life as before the loss of his member, so that in our opinion the court committed no error in the inclusion of this element in the instruction.

The judgment of the court below was affirmed.

Mortality Tables Admissible in Evidence

(Penley v. Teague & Harlow Co. (Me.), 140 Atl. 374)

In this action for damages for personal injuries, the plaintiff alleged that, because of the negligence of the defendant, she had received multiple contusions and abrasions, tearing and lacerating the flesh of her face, nose, chin, lips and eyes, causing soil, dirt, gravel and other substances to be ground into the tissues of her face, whereby she became permanently injured and disfigured. At the time of the accident she had pursued the study of music for about ten years and claimed to have made marked progress and received liberal patronge as a teacher. She claimed, however, that the disfigurement of her face rendered her unattractive to such an extent as to affect her popularity as a teacher and her ability to obtain and to retain pupils. Medical witnesses called by the plaintiff and those called by the defendant testified that the disfiguration was permanent. In the course of the trial, counsel for the plaintiff read from mortality tables the expectancy of her life. The defendant objected because the tables were not shown to be of standard authority and because the life expectancy was not material since the plaintiff had not proved to a reasonable certainty any future disability. The objection was overruled. A verdict for $7,500 followed, and the defendant took the case to the supreme judicial court of Maine, moving for a new trial. That court, after citing authorities, held that the admission of the mortality tables was proper, if any of the injuries suffered by the plaintiff were permanent and would in any degree affect her earning capacity. So far as the records showed, the jury must have found, under proper instructions, that the disfigura-

tion of the plaintiff was permanent and diminished her earning capacity, and that it was due to the defendant's negligence, without contributory negligence on her part. But in the opinion of the court the damages awarded were plainly excessive and the exceptions of the defendant were overruled only on condition that she would remit all of the verdict in excess of $3,500. Otherwise, the motion of the defendant for a new trial would be granted.

Nonmedical Roentgenologist as a Medical Expert

(Robertson v. Aetna Life Ins. Co., et al. (Ga.), 141 S. E. 504)

The plaintiff in error, Robertson, was in receipt of compensation under an award under the workmen's compensation act. The insurer applied to the industrial commission for an award ending compensation, on the ground of an alleged change in Robertson's condition. The commission made the award asked for. Robertson thereupon appealed to the superior court, but it affirmed the award. He thereupon appealed to the court of appeals of Georgia. The court pointed out that there was competent evidence to justify the finding by the industrial commission that the disability of employee had ceased. Findings of fact made by the industrial commission within its power and on sufficient competent evidence are, in the absence of fraud, conclusive both on the superior court and on the court of appeals. In discussing the evidence in the case, the court pointed out that "an expert is one who by habits of life and business has a peculiar skill in forming an opinion on the subject in dispute," and concluded that a person who is neither a physician nor a surgeon may testify to an opinion on any medical opinion, when the matter inquired about lies within the domain of the profession or calling which the witness pursues. The court held that "one who has practiced as an x-ray specialist for fifteen years, and who has made a special study of the anatomy of the human body during that period, may testify to the making of x-ray pictures of certain bones of a particular person, and may give his opinion therefrom as to whether the bones have been injured, even though the witness is not a graduate of a medical school and has not been licensed to practice medicine." The judgment of the court below terminating compensation was affirmed.

Unitemized Bill Insufficient to Prove Indebtedness

(Proto v. Chenoweth (Ariz.), 263 Pac. 943)

The defendant in error, a physician, plaintiff in the court below, presented his claim for payment for services to his deceased patient, Anton Proto, Sr., to his patient's administrator, for allowance. Subsequently he brought suit against the administrator for "professional services to the said Anton Proto and to various other persons." The administrator thereupon demanded a bill of particulars or a copy of the plaintiff's account. He was dissatisfied with a so-called bill of particulars submitted by the plaintiff and moved the court to require him to make it more specific. The plaintiff thereupon filed another so-called bill of particulars, but in it he merely omitted all reference to his claim for payment for services rendered to persons other than the deceased and stated his account month by month, simply claiming $500 each month for twenty-nine months. In the course of the trial in the superior court, Santa Cruez County, where the case was tried without a jury, the plaintiff was permitted to testify as to the services he rendered. The trial resulted in a judgment in favor of the plaintiff for $10,000 and the defendant appealed to the supreme court of Arizona. The supreme court found that the inclusion in the complaint of charges for services rendered to persons other than the deceased was improper, since no claim for payment for such services had been embodied in the claim presented to the administrator for allowance. It held, however, that the inclusion of such a claim in the complaint did not make it demurrable and suggested that the claim would doubtless have been stricken out on motion. The court found that what the plaintiff served on the defendant as bills of particulars in response to the defendant's request did not in the least amplify or explain the general allegations of the complaint; when the complaint and the two so-called bills of particulars were taken and considered together, they not only did not inform the defendant what he was required to meet but left the issue in extreme confusion and obscurity. The reason for requiring an itemized statement of an account, consisting of items and transactions running over a considerable period of time, is to inform the adverse party with what he is charged and to afford him an opportunity to marshal his evidence to meet the charges. Even if the deceased patient were alive and himself the defendant, he would be entitled to an itemized statement of what he owed him, if not before suit, at least before trial. The need of such information on the part of the administrator, who must prepare the defense without any personal knowledge whatever of the items which make up the claim against his testator, was much greater. Paragraph 421 of the Civil Code requires a party to a suit to deliver to the adverse party within ten days after a demand therefor, in writing, a copy of the account, or be precluded from giving evidence thereof. Under the law, it was error to permit the plaintiff to introduce any evidence in support of his complaint, since he failed to furnish the defendant a bill of particulars or a copy of his account as required by law. And, in the absence of evidence, there was no case made out. Judgment was therefore reversed and the cause remanded to the court below, with instructions to enter judgment in favor of the defendant.

Validity of Oral Promise to Pay

(Huntoon v. Powell (Calif.), 263 Pac. 1030)

The plaintiff, a physician, at the request of Mrs. M. E. Powell attended her professionally from July 13, 1921, to March 16, 1923. Sept. 1, 1921, after most of plaintiff's services had been rendered, the defendant, the patient's son, E. A. Powell, orally promised to pay the plaintiff, and on September 15 he paid $100 on account. In the suit as originally filed, Mrs. Powell and her son were named as defendants, but before the trial Mrs. Powell died and the suit was discontinued as to her. The plaintiff contended that his patient, Mrs. Powell, was a poor person unable to maintain herself by work, and in support of the validity of her son's promise to pay he cited section 206 of the Civil Code of California. This section makes it the duty of the children of any poor parent who is unable to maintain himself by work to maintain such parent to the extent of their ability and provides that the promise of an adult child to pay for necessaries previously furnished to such a parent shall be binding. The court found that the mother came within the class of persons named and gave judgment for the plaintiff. From that judgment the defendant appealed to the district court of appeal, second district, division 1. The appellant cited subdivision 2 of section 1624 of the Civil Code, providing that a special promise to answer for the debt, default or miscarriage of another must be in writing, and contended that section 206, when it made binding the promise of an adult child to pay for necessaries previously furnished to his parent, merely supplied the element of consideration when the promise was in writing and but for the provisions of the code would be invalid, because of the absence of a consideration. The appellate court found that there was no evidence in the record to sustain the finding of the court below that the defendant's mother was a poor person who was unable to maintain herself by work and that even by the most liberal inference no such conclusion could be drawn from the fact that she herself had not paid the bill for services and that the appellant had promised to pay it. The question whether a promise in a case such as that before the court must be in writing to be valid had already been passed on, the court said, by the supreme court of California in *Flournoy* v. *Van Campen*, 71 Calif. 14, 12 Pac. 257, in which the facts were almost identical with those in the instant case. The supreme court there held that although some of the services rendered by the defendant were rendered after his contract with the defendant, some were rendered before; that the services rendered prior to the contract with the defendant were rendered at the instance of the defendant's mother and for them she was bound to pay, and that compensation for the defendant's services in the case, so far as records show, was not susceptible of severance. The debt was therefore the mother's debt, and for it the defendant, under the statutes, could bind himself only in writing. In the present case, therefore, in view of the circumstances, judgment for the plaintiff was reversed.

Society Proceedings

COMING MEETINGS

American Association of Railway Surgeons, Chicago, October 31-November 2. Dr. Louis J. Mitchell, 29 East Madison Street, Chicago, Sec'y.
Association of American Medical Colleges, Indianapolis, October 29-31. Dr. Fred C. Zapffe, 25 East Washington Street, Chicago, Secretary.
Clinical Orthopedic Society, Chicago, November 19-20. Dr. Robert V. Funston, 1337 David Whitney Building, Detroit, Secretary.
Medical Society of the Missouri Valley, Omaha, October 30-November 1. Dr. Earl C. Sage, Medical Arts Building, Omaha, Secretary.
Ohio Valley Medical Association, Evansville, Ind., November 14-15. Dr. Bruce H. Beeler, 3rd and Main Streets, Evansville, Secretary.
Philippine Islands Medical Association, Manila, December 12-15. Dr. A. S. Fernando, 547 Calle Herran, Manila, Secretary.
Porto Rico, Medical Association of, San Juan, Dec. 1. Dr. M. Pavia Fernandez, Salvador Brau 51, San Juan, Secretary.
Radiological Society of North America, Chicago, December 3-7. Dr. Robert J. May, 5005 Euclid Avenue, Cleveland, Secretary.
Southern Medical Association, Asheville, N. C., November 12-15. Mr. C. P. Loranz, Empire Building, Birmingham, Ala., Secretary.
Southern Surgical Association, White Sulphur Springs, W. Va., December 11-13. Dr. R. L. Payne, Medical Arts Bldg., Norfolk, Va., Sec'y.
Western Surgical Association, Chicago, December 14-15. Dr. Harry P. Ritchie, 914 Lowry Building, St. Paul, Secretary.

THE AMERICAN ASSOCIATION FOR THE STUDY OF ALLERGY

Sixth Annual Meeting, held June 11-12, 1928, at Minneapolis

The President, DR. HARRY S. BERNTON, Washington, D. C., in the Chair

A Critical Review of the Mechanism and Terminology of Allergy

DR. JOHN A. KOLMER, Philadelphia: In the interests of orderliness and clearness, it is advisable to get rid of many terms which now contribute so materially to confusion. The following simple terminology is recommended:

1. To employ the term allergy and abandon the terms anaphylaxis, hypersensitiveness, idiosyncrasy and atopy.

2. To designate the exciting agent as allergen and abandon the terms anaphylactogen, sensibilogen, sensitinogen and atopen.

3. To base classification on what is known of the chemical nature of the exciting agent and drop classifications based on the success or failure of demonstrating antibody in the blood by passive transfer of sensitization to guinea-pigs or human skins or according to success or failure of active sensitization of guinea-pigs. Or to base it on a division into clinical types, as the dividing line between acquired and natural allergies is too poorly defined for classification on these grounds, as is likewise a division into so-called normal and abnormal allergies.

4. To designate the antibody as allergin or allergic antibody and abandon the terms anaphylactin, sensitizin, reaction body, albuminolysin, precipitin and reagin.

5. To adopt the cellular theory in its essentials as the underlying mechanism and abandon the humoral and related theories.

6. To adhere to the terms active and passive sensitization because less cumbersome, more euphonious and better known than the term allergization.

7. To adhere to the term desensitization for expressing a decrease of symptoms under therapeutic intervention as a result of increased toleration for the exciting agent, even though its exact mechanism is unknown.

The Potential Asthmatic Patient

DR. F. M. POTTENGER, Monrovia, Calif.: There are two causes of asthma, the fundamental underlying cause and the precipitating cause. When one sees a patient suffering from a paroxysm of asthma, the dyspnea as a rule overshadows all other symptoms. In the presence of an acute emergency one is more likely to pay too much attention to the precipitating cause. Asthma expresses itself as a local parasympatheticotonia usually in an individual who shows more or less general parasympatheticotonic phenomena. Constitutionally, asthma is associated with an overbalance of the parasympathetic nerves; an overbalance of potassium as compared with calcium in the cells; an increase in hydroxide ions as compared with the hydrogen ions of the tissues; and a deficiency in certain sympatheticotonic endocrines, such as the suprarenals, thyroid, parathyroid and gonads. Protein sensitization, chemical and mechanical irritation, sensitiveness to weather changes, and response to reflex impulses from other organs are only precipitating factors in a disorganized neurocellular mechanism. Treatment must be directed not only to the relief from the precipitating cause but also to changing whenever possible the hypersensitive neurocellular mechanism.

The potential asthmatic is one in whom the fundamental underlying cause is still active but the exciting cause is not in play. So far we do not know how to cure the fundamental underlying condition but we do know certain measures that improve the imbalance. Parasympatheticotonia is not a matter of hyperirritability of the nerves alone. It is a complex condition in which the tissues that react with the parasympathetics also play an important part. Relief of parasympathetic syndromes may be brought about by forces that depress parasympathetic nerve action or by forces that stimulate the antagonistic sympathetic neurons, or by decreasing the substances that are responsible for activity in parasympathetic structures, or by increasing the substances that produce inhibition in them. Among the remedies applied in these four methods for relief are epinephrine, thyroid, parathyroid and testicular hormone, atropine and calcium. Calcium acts with and fortifies sympathetic activity, it allays muscular hyperactivity and spasm, and it decreases the permeability of cell membranes, thus reducing the tendency to exudation. Often blood calcium is found to be normal in asthmatic patients but it is not the blood calcium alone that should be considered, rather the potassium-calcium ratio, the relative tonus of the sympathetic and parasympathetic nerves, the hormone balance and the hydrogen-hydroxide ratio.

Pathology of Asthma: Nonbacterial Allergic and Bacterial Types Based on Autopsy Material

DRS. BERNARD STEINBERG and KARL D. FIGLEY, Toledo, Ohio: We have seen two cases in which death had occurred apparently from uncomplicated asthma. The first was of the nonbacterial protein sensitive type and the other was bacterial in type. From our observations we suggest that the dyspnea in asthma may not be due so much to smooth muscle spasm as to obstructive exudation. Pathologic differentiation between nonbacterial allergic asthma and bacterial asthma is suggested in the following table:

Nonbacterial Allergic Asthma	*Bacterial Asthma*
1. Marked emphysema.	1. Slight emphysema.
2. No atelectasis.	2. Moderate atelectasis.
3. Lumen of large, medium and small bronchi and bronchioles partly or entirely occluded.	3. Lumen of small bronchi and bronchioles partly or completely occluded.
4. Material in the bronchial lumens mainly mucoid which adheres to lining cells.	4. Material in the bronchial lumens mostly cellular and it does not adhere to lining cells.
5. Little or no destruction of the lining bronchial epithelium.	5. Moderate to marked destruction of the lining bronchial epithelium.
6. Marked hypertrophy of the bronchial musculature.	6. Moderate hypertrophy of the bronchial epithelium.
7. A large number of eosinophils in the cellular exudate within the lumen and in the bronchial wall.	7. Few eosinophils in the cellular exudate within the lumen and in the bronchial wall.
8. Hypertrophy, hyperplasia and hypersecretory activity of the mucous glands.	8. Hyperplasia of the mucous glands but little secretory activity.

DISCUSSION

DR. HARRY L. HUBER, Chicago: At autopsy in a case of death from morphine poisoning in an asthmatic attack, minute ulcers were found scattered through the bronchial tree. These breaks in surface continuity may be the locations where toxic materials are absorbed.

Some Causes of Therapeutic Failure in Clinical Allergy

DR. WARREN T. VAUGHAN, Richmond, Va.: It is important to read delayed reactions not only at the end of twenty-four hours but also after from four to six hours. In 18 per cent of cases that were benefited the diagnosis was made on the delayed reaction alone. For a successful delayed reaction, the scratch must be longer than is usually applied. My scratch is usually about three-eighths inch long. I prefer using the back to the arm. I would emphasize the importance of borderline reactions especially when they show up on two or more of the three readings. Thirty-four per cent of my series showing only borderline reactions obtained satisfactory relief from protein avoidance.

Where scratch tests are negative, intradermal tests must be applied. Sometimes even these are negative in positive reactors. Previous administration of epinephrine or ephedrine will give a falsely negative skin reaction. Constitutional factors in the patient are of equal importance with specific protein sensitization.

Allergic Bronchitis

DR. GEORGE L. WALDBOTT, Detroit: In a series of cases of bronchitis in which asthma did not enter into the picture, removal of contact with the offending protein resulted in relief. These usually occurred in individuals with allergic family histories. This form of bronchitis is characterized by its sudden onset, dry unproductive cough, and response to ephedrine and epinephrine. The same type of cough sometimes inaugurates asthmatic attacks, but in several individuals with inherited hypersensitiveness it was found as the only sign of their allergic constitution.

DISCUSSION

DR. ALBERT H. ROWE, Oakland, Calif.: I have seen cases that did not give positive sensitization reactions, but when the patients were placed on elimination diets in which all common foods were avoided, relief was obtained.

DR. M. MURRAY PESHKIN, New York: This allergic bronchitis may appear altogether independently of asthma or again it may occur during the intervals of freedom from asthmatic attacks. The condition is more readily demonstrated in children than in adults.

DR. I. S. KAHN, San Antonio, Texas: I have seen such children and prophesied that later they would develop true asthma, which they did. When pollen was the apparent cause of the allergic bronchitis I was able to relieve it by placing the patients in pollen-free rooms. There seems to be an intermediate stage between hay-fever and true bronchial asthma, characterized either by tracheitis or by bronchitis.

Comparative Pollen Counts in Various Districts in the United States

DR. O. C. DURHAM, Indianapolis: The first pollen count of atmospheric air appears in Blakely's book, written in 1873. The technic of pollen counting is very simple and gives valuable information during a hay-fever period, particularly as to the relative amounts of allergenic contact. With ragweed the distribution in a city is very much the same whether the pollen station is down town or out in the suburbs. Seasonal pollen curves were compared for several cities scattered through the United States: Oklahoma City, Indianapolis, Kansas City, Chicago, New Orleans, New York, Philadelphia, Richmond, Va., and Oakland, Calif. The average ragweed pollen incidence is markedly higher in the Middle West than in the East. There is practically no ragweed pollen in the air in California.

Use of Filtered Air in the Diagnosis and Treatment of Allergic Conditions

DR. MILTON B. COHEN, Cleveland: The pollen filter used in asthma and hay-fever consists of a motor-driven suction fan covered by a filter bag made of several layers of specially woven woolen cloth covered by one layer of cotton cloth, with the entire mechanism enclosed in a metal housing. The intake is connected to a special screen fitted to the window opening by means of a metal pipe. The filter produces positive pressure in the room so that other cracks need not be stopped up. In the winter time the air intake is connected through a wall with another room in the house so that warmed air is obtained. Hot air flues are sealed up. Electric fans may be used to keep the air in the room circulating. These filters remove 62 per cent of tobacco smoke with a particle size of 0.27 micron, and 95 per cent of zinc oxide with a particle size of from 0.3 to 0.4 micron. They may be depended on to remove all noncorrosive particles larger than 1 micron. In some cases of pollen allergy, just sleeping for eight hours in a pollen-free room enabled the patient to increase his nonreactivity enough so that he could go about his regular work in the day time. The number of hours that must be spent in filtered air varies directly with the air pollen concentration. In the very severe cases at the peak of the season with high pollen concentration, from eighteen to twenty-two hours daily must be spent in pollen-free air. Patients who had received partial relief following preseasonal desensitization were rendered symptom free by residence in filtered air for a few hours daily. When symptoms were already well established, it required from two to seven days in filtered air for the symptoms to subside. Among ten cases in which the cause for asthma could not be determined and in which by exclusion a diagnosis of bacterial allergy would usually have been made, five became symptom free in pollen-free atmosphere.

DR. I. S. KAHN, San Antonio, Texas: I have had some excellent results by placing patients in pollen-free rooms. If a patient does not clear in a week behind a pollen filter, I continue the treatment. In one or two cases a filter has been required one or two months before a final clearing. One case required five months. A fairly efficient pollen filter may be built for a few dollars with an ordinary window screen, a backing stuffed with half the thickness of absorbent cotton such as comes in an ordinary pound roll, which is basted between cheese-cloth, and an ordinary 12 or 14 inch electric fan, or, if necessary, two fans.

Incidence and Significance of Negative Skin Tests in Pollen Asthma in Infants and Young Children

DR. I. S. KAHN and EMMA M. GROTHAUS, San Antonio, Texas: Negative skin tests are comparatively frequent in infants and young children with bronchial asthma of pollen etiology. These negative skin tests apparently indicate a low degree of hypersensitiveness. Advantage may be taken of this low sensitivity to secure successful clinical results by proper prophylactic measures; that is, pollen avoidance without the institution of specific desensitization.

DISCUSSION

DR. MILTON B. COHEN, Cleveland: A patient showing evanescent positive skin reactions, from day to day manifested reactions to pollens and orris root which varied from positive to negative. Passive sensitization tests showed that the blood still reacted even though the skin was negative.

DR. WARREN T. VAUGHAN, Richmond, Va.: I have seen little negative skin reaction in demonstrated pollen-sensitive cases. Pollen prevalence last year was lower in Richmond than in any of the other cities surveyed by Durham. The low pollen prevalence made it unlikely that very mildly sensitive cases in the vicinity of Richmond with negative skin reactions would develop clinical hay-fever sufficient to require consultation. I have seen cases of food allergy giving negative food reactions.

DR. M. MURRAY PESHKIN, New York: Negatively reacting positive pollen cases have occurred in New York. My conjunctival test is often positive when the skin test is negative.

DR. I. S. KAHN, San Antonio, Texas: If we are to depend entirely on the results of skin tests and are to call negative skin reactions always evidence of nonsensitization, we are going to meet many pitfalls.

The Value of Phosphorus and Calcium in Bronchial Asthma, Hay-Fever and Allied Diseases: A Study of Eighty-Five Cases

DR. ALEXANDER STERLING, Philadelphia: We found a calcium deficiency in only a small proportion of eighty-five cases of allergy. Sixty-eight, however, showed a pronounced phosphorus deficit in the blood. Very good results were obtained from the administration of phosphorus compounds.

Nonspecific Diagnosis of Allergy

DR. SAMUEL FEINBERG, Chicago: The Van Leeuwen test, described in 1922 by Van Leeuwen, consists in determining the reaction to human dander. It is supposed to be rather a general indicator of allergic sensitivity, being usually positive in individuals who give positive reactions to other specific proteins and negative in cases in which there are no other positive allergic reactions. In 1926 Van Leeuwen estimated that this test was positive in from 90 to 95 per cent of all allergic patients and was never positive in normal persons. He thought that the reacting substance in dander might be the same that produces positive reactions in house dust and mentions particularly animal and plant parasites, especially *Aspergillus fumigatus*. Keller found the test positive in all of a series of twenty-one cases of eczema. He found it positive in one of two

cases of hay-fever and negative in two cases of urticaria. I have found the intradermal Van Leeuwen test positive in practically all individuals manifesting cutaneous reactivity to proteins. In 183 allergic cases, 138 of which had given positive skin tests to one or another allergen and forty-five negatives, the human dander test failed to show agreement in only four instances.

DISCUSSION

DR. M. MURRAY PESHKIN, New York: I have not obtained such results even though I got the dander from Van Leeuwen. I seriously doubt the value of the test.

DR. RAY M. BALYEAT, Oklahoma City: In migraine and urticaria the human dander reaction was seldom positive. In the majority of pollen-sensitive cases there were only very mild dander reactions, but in practically all animal dander sensitizations the human dander reaction was strongly positive. I believe that the test will have some value in occasionally differentiating a truly allergic case from a nonallergic one.

DR. LEON UNGER, Chicago: The test will be of value in eliminating the necessity for skin testing of nonallergic cases.

Chronic Use of Epinephrine in the Treatment of Asthma

DR. WILLIAM W. DUKE, Kansas City, Mo.: Cold-sensitive patients usually have subnormal temperatures and react when the temperature is low. Some react to cold, others to heat. Heat and cold sensitivity may be due to injury to the heat-regulating mechanism. In one case of physical allergy, an asthmatic patient who had a usual temperature of 92 F., the slightest heat would make him break out. He did not sweat. His skin was as dry as paper. I tried by various means to bring the temperature to normal with consequent improvement of symptoms. In the persisting asthmatic patient, tremendous doses of epinephrine are sometimes used. Whisky and acetylsalicylic acid enable the patient to do with much less epinephrine. Morphine should be avoided.

Current Medical Literature

AMERICAN

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Titles marked with an asterisk (*) are abstracted below.

American J. Ophthalmology, Chicago

11: 685-766 (Sept.) 1928

Intravenous Use of Typhoid-Paratyphoid Vaccine in Eye Diseases. H. J. Howard, St. Louis.—p. 685.
Bacterial Antigen in Uveitis. R. E. Mason, St. Louis.—p. 702.
Glaucosan in Glaucoma. D. K. Pischel, San Francisco.—p. 705.
Pulsating Exophthalmos: Case. De W. Hallett, New York.—p. 710.
Noncompensable Visual Defects in Industrial Ophthalmology. G. R. McAuliff, Chicago.—p. 714.
New Operative Procedure in Cases of Shallow Anterior Chamber. W. F. Swett, San Francisco.—p. 717.
Orbital Involvement from Nasal Sinus Disease Simulating Cavernous Sinus Thrombosis. H. M. Langdon, Philadelphia.—p. 719.
Disciform Macular Degeneration. B. Cushman, Chicago.—p. 720.
Parinaud's Conjunctivitis. R. A. Tomassene, Wheeling, W. Va.—p. 721.

Archives of Ophthalmology, New York

57: 447-560 (Sept.) 1928

Hemangiomas of Cerebellum and Retina (Lindau's Disease): Case. H. Cushing, Boston, and P. Bailey, Chicago.—p. 447.
Lens Protein—Isolation of Third (Gamma) Crystallin. E. L. Burky and A. C. Woods, Baltimore.—p. 464.
Study of Recession of Choked Disks Following Operations for Brain Tumor. G. Horrax and C. Haight, Boston.—p. 467.
Eye Conditions in Leukemia: Four Cases. B. Sachs, Boston.—p. 474.
Analytic Observations on Vitreous Humor from Normal and Glaucomatous Eyes. C. Newcomb and R. E. Wright, Madras, India.—p. 480.
Hemangioma of Choroid: Case. S. B. Marlow, Syracuse, N. Y.—p. 484.
Protein Therapy: Specific and Nonspecific in Ophthalmology. A. C. Woods, Baltimore.—p. 488.
Cloquet's Canal Visible in Living: Hemorrhage into Cloquet's Canal. O. Barkan, San Francisco.—p. 502.
Rôle of Arsphenamines in Production of Ocular Lesions. E. L. Zimmermann, Baltimore.—p. 509.

Archives of Surgery, Chicago

17: 355-534 (Sept.) 1928

*Simple, Nonspecific Ulcer of Colon. M. E. Barron, Boston.—p. 355.
*"Stream Line" Phenomena in Portal Vein and Selective Distribution of Portal Blood in Liver. G. H. Copher and B. M. Dick, St. Louis.—p. 408.
*Rôle of Circulation in Healing of Fractures. W. H. Robinson, Pittsburgh.—p. 420.
*Studies in Intestinal Obstruction: I. Strangulation Obstruction: Comparison of Toxicity of Intestine and Other Tissues Autolyzed in Vivo and in Vitro. O. H. Wangensteen and G. W. Waldron, Minneapolis.—p. 430.
*Intestinal Tuberculosis Causing Obstruction. J. R. B. Branch, Peking, China.—p. 440.
Malignant Tumors of Wall of Chest. C. D. Lockwood, Pasadena, Calif.—p. 459.
*Craniotomy Incisions Without Forceps. A. S. Crawford, Detroit.—p. 472.
*Fracture Dislocation of Shoulder: Relation of Soft Parts to Restoration: New Method of Treatment. R. T. Taylor, Baltimore.—p. 475.
Wounds of Heart: Two Cases. D. M. Cox, Louisville, Ky.—p. 484.
Spontaneous Dislocation and Destruction of Tendon of Long Head of Biceps Brachii: Fifty-Nine Instances. A. W. Meyer, Palo Alto, Calif.—p. 493.
Intra-Intestinal Pressure in Obstruction. J. C. Owings and others, Baltimore.—p. 507.
Thirty-Sixth Report of Progress in Orthopedic Surgery. P. D. Wilson, Boston, and Others.—p. 521.

Simple Nonspecific Ulcer of Colon.—Fifty-three cases of simple, nonspecific ulcer of the colon are analyzed by Barron. Fifty cases were collected from the literature and three were personal cases. There were thirty-four autopsies, one incomplete autopsy and two deaths without autopsies in this series. Fifteen patients were cured as a result of operation; two of these patients had intestinal resections performed and the resected colon was studied grossly and microscopically. The others were studied only by visualization at the time of operation. In one case, it was not stated whether the patient survived or not. There were approximately twice as many cases of ulcer of the colon in males as in females. Perforations occurred in forty-two of the fifty-three cases.

Portal Circulation in Liver.—The distribution of the portal blood in the liver of the dog was determined by Copher and Dick by the injection of a dye. Blood from the spleen, the stomach and a greater part of the colon goes to the left lobe of the liver, whereas blood from the duodenum, the head of the pancreas and the upper part of the jejunum goes mainly to the right lobe of the liver. A satisfactory method of visualizing experimentally the individual currents of blood in the portal vein is presented. There are at least three distinct and separate currents in the portal vein. The anatomy of the portal vein and the intrahepatic distribution of its blood in the dog were studied, and the results are presented.

Rôle of Circulation in Healing of Fractures.—Whether or not there are any systemic causes for delayed union and nonunion of fractures, Robinson says that there would seem to be ample reason to believe that the consistent use of methods of treatment of fractures that require (1) good apposition, (2) adequate provision for expansion of surrounding structures and (3) freedom from any shearing or hinge motion between the fragments will be rewarded by a much lessened morbidity percentage. Good apposition is, of course, routine and needs no word of defense. Ample provision for expansion is not always provided in the cast, splint or other device used. Too much emphasis cannot be laid on the importance of splitting or bivalving the cast or of maintaining a constant watchfulness over circumferential bandages that they may never be too tight. A bandage may be correct at the time of its application, but overnight, from restlessness of the patient or from his having had the injured part in a dependent position, the limb may have swollen until the bandages are tight. Much can be done at the first dressing to prevent excessive hemorrhage and inflammatory reaction. The part should be placed in the position of election. It is unnecessary and contributory to excessive swelling for one to endeavor to make an exact diagnosis by manipulation; roentgen-ray examination should follow the first dressing as soon as possible and readjustment of any deformity shown may

then be made as soon as convenient, after which the roentgen ray should be employed to verify the position of fragments. The fracture appliance, of whatever type, should not permit of any motion of the bone at the site of the fracture. The old rule to splint the proximal and distal joints is a good one. Fractures should not be dressed frequently, unless the cause is imperative, and in dressing should be handled firmly and gently so that there is no motion between the fragments. Open operations should be so planned and conducted as to minimize the injury to the surrounding circulation. The use of a tourniquet is not advisable, since with it one is not cognizant of the amount of injury being inflicted on the circulation. Fibrous tissue about the fragments should be removed, and likewise eburnated bone which is too compact to permit formation of new vessels with the consequent anastomotic phenomena so important in repair of fractures.

Studies in Intestinal Obstruction.—Comparisons have been made by Wangensteen and Waldron of the toxicity of intestine and various tissues on autolysis in vivo and in vitro. The products of disintegration of the intestine were found to be markedly toxic when segments of small intestine were allowed to autolyze in the peritoneal cavity or when rats were given intraperitoneal injections of the products of autolysis of intestine from sterile containers kept in the incubator. A marked increase in the urinary excretion of nitrogen was observed in the animals in which various tissues were allowed to autolyze; however, only a slight increase in the nonprotein nitrogen of the blood occurred. The low values for blood chlorides observed in dogs with obstruction of the upper part of the intestine were not obtained in strangulation of the intestine alone (closed loop obstruction with gangrene) when the continuity of the remainder of the intestinal tract was restored. The subcutaneous administration of saline solution to animals with disintegrating segments of intestine appeared to be valueless.

Intestinal Tuberculosis Causing Obstruction.—Eight cases of hyperplastic intestinal tuberculosis with obstruction of varying degrees are reported on by Branch. The lesions were in the terminal ileum, cecum and ascending colon; in several cases the appendix also was involved in the tuberculous process. Two were associated with tuberculous peritonitis, one in the ascitic and one in the early plastic stage. Three patients had evidence of previous pulmonary tuberculosis, but in only one was the process active. One of the specimens showed a coexisting old infection with *Schistosoma* in the cecum and ileum, associated with tuberculosis. The outstanding feature in all of the cases was a generalized thickening of the entire wall of the bowel with old, healed scar tissue resulting in stenosis of the lumen; in several cases, the stricture was 5 mm. or less in diameter. Ulceration was not prominent, though in most of the cases small healed and unhealed ulcers were found. Grossly, little was seen to suggest more than a determined and successful reaction to combat a chronic infectious process, so that the pathologist was disinclined to agree with the clinical diagnosis of tuberculosis until sections were examined. The gross pathologic picture would have been the same if the causative agent had been dysentery, *Schistosoma* or any other chronic irritant. In some instances glandular involvement was observed; it was extensive and marked in one case. Resection of the diseased portion of the bowel with enterocolostomy is the operation of choice; this was done in six cases, with one death and five recoveries. The one death was due to peritonitis caused by a leakage. One patient had also extensive tuberculous peritonitis and was not in condition to stand more than an enterostomy to relieve the obstruction. Another was also in rather poor condition, and there was extensive and massive involvement of the mesenteric and retroperitoneal glands, with caseation and softening; the abdomen, after exploration, was closed without further treatment.

Craniotomy Incisions Without Forceps.—Crawford uses a method which keeps the operative field free of forceps and which at the same time efficiently covers the scalp, controls bleeding and protects the edges of the incision. This is by the use of stockinet and Michel clips. After the field block has been made with procaine hydrochloride, the incision line is scratched till it bleeds; then the stockinet is laid over the whole operative field and cut along the blood-stained line. The skin incision is made in the usual manner, a few inches at a time, and bleeding is controlled by digital pressure. When a spurting vessel is encountered, it is caught at once and stick tied with silk. All other oozing is controlled with the clips. The clips are placed external to the pericranial layer, about 12 mm. apart and directly over bleeding points wherever possible. After the bone flap has been turned, the wound edges are covered with wet cottonoid sheets, so that the field is smooth and level and the clips are protected. During closure, the clips are removed a few at a time, as the skin sutures are placed and tied, to prevent excessive bleeding from the scalp.

Fracture Dislocation of Shoulder.—Taylor asserts that traction in abduction and outward rotation and putting the capsule on the stretch in early treatment will reduce anterior and inward dislocation of the humeral head and that hyperabduction, carefully guided by a series of roentgen-ray studies, may entirely overcome the nonalinement.

Canadian M. Association Journal, Montreal

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Decline of Infectious Disease in Its Relation to Modern Medicine. T. Smith, Princeton, N. J.—p. 283.

*Use of Sulphocyanate of Soda in High Blood Pressure. A. G. Smith and R. D. Rudolf, Toronto.—p. 288.

Prevention of Maternal Mortality in Manitoba. R. Mitchell, Winnipeg, Man.—p. 292.

*Anatomic Anomaly of Aorta and Pulmonary Circulation. D. Wheeler, Winnipeg, Manit., and M. E. Abbott, Montreal.—p. 297.

*Treatment of Epilepsy. C. H. Pratt, Woodstock, Ont.—p. 303.

Some Common Mistakes in Diagnosis and Therapy of Diseases of Children. A. Brown, Toronto.—p. 313.

Spontaneous Cerebral Hemorrhage. F. H. Mackay, Montreal.—p. 318.

Types of Epidemic Encephalitis in New Brunswick. A. F. van Wart, Fredericton, N. B.—p. 325.

Postoperative Pulmonary Complications. E. Rae, Toronto.—p. 328.

Electrotherapy in General Practice. A. Calder, Sydney, N. S.—p. 331.

*Pneumococcic Meningitis. W. R. Kennedy, Montreal.—p. 336.

Eczema. H. Orr, Edmonton, Alta.—p. 339.

Foreign Body in Knee Joint (Joint Mouse). A. T. Bazin, Montreal.—p. 341.

Unusual Type of Supernumerary Digit. S. H. Corrigan, Lampman, Sask.—p. 342.

Giant Cell Tumor of Neck of Femur: Operation with Probable Cure. W. G. Turner, Montreal.—p. 342.

Embolism or Thrombosis of Central Retinal Vessels. A. Cantero, Quebec.—p. 344.

Simple Apparatus for Continuous Intravenous Administration of Physiologic Salt Solution. R. I. Harris and W. O. Stoddart, Toronto.—p. 346.

Normal Ranges for Laboratory Findings. R. E. Coleman, Vancouver.—p. 349.

Use of Sodium Sulphocyanate in High Blood Pressure.—Smith and Rudolf administered sodium sulphocyanate, in 5 grain (0.32 Gm.) doses, in water, thrice daily after meals, to normal persons and to persons with an elevated blood pressure. They found that it causes a fall in pressure, especially in the systolic, with usually no change in the rate of the heart. This fall occurs when the pressure is normal as well as when it is abnormally high. In patients showing much kidney injury or arteriosclerosis, the effect is least evident but usually occurs to some extent. The best results are obtained in the large class coming under the heading of "essential hyperpiesis." The sulphocyanates have been observed to have a sedative effect and are often mildly hypnotic. They are easy to administer, and not unpleasant to take in an aromatic mixture. A dose of 2½ grains (0.16 Gm.), twice or three times daily, is sufficient to give the effects.

Anomaly of Aorta and Pulmonary Circulation.—Wheeler and Abbott report a case of double aortic arch and pulmonary atresia, with pulmonic circulation maintained through a persistent left aortic root, in a man, aged 29. He had had a cough for one year, with expectoration for the past three months; he spit up three or four mouthfuls of blood every time he coughed. He had lost 25 pounds (11.3 Kg.) in the last two years; weakness and malaise had been progressively worse since 1914; he had had dyspnea for as long as he could remember, with cyanosis, clubbing of the fingers and toes, and palpitation. His condition was diagnosed as an advanced pulmonary tuberculosis, showing marked involvement of the right upper lobe, with some dulness over the left upper lobe and late post-tussic crepitations on both sides. He died at the age of 29. At necropsy both lungs showed old tuberculous lesions, with cavitation and scarring in both apexes. An extensive miliary

tuberculosis had invaded the remaining parenchyma of both lungs. The heart was a large muscular organ, the transverse diameter being 12 cm. and the distance from coronary sulcus to apex 10 cm. The muscular portion appeared to be composed of the two ventricles equally, separated by a prominent interventricular sulcus. Arising from the base of the heart only one great vessel was to be seen, which measured 3.5 cm. in diameter. This vessel curved to the right, giving off in the following order the left innominate, right carotid and right subclavian arteries, and descended on the right side of the vertebral column behind the right bronchus. An additional small artery arose below this trunk from the anterior aspect of the aorta, and passed to the lower lobe of the left lung. A large thin-walled, trumpet-shaped vessel emerged from the left posterior wall of the right aortic trunk, the size of its communication with the aorta being 0.5 cm. in diameter, and flared out to empty into the hilum of the right lung. The venous return from the lungs and the systemic return to the heart were normal. The heart when opened showed marked hypertrophy of the ventricular walls, the right being 2 cm. and the left 1.5 cm. thick. The two ventricles communicated freely with each other over the top of the interventricular septum, which presented a smooth upper margin, completely covered with endocardium. Arising from the base of the heart above the upper free border of the interventricular septum was the thick-walled aorta. The left atrium was normal in size; the right atrium was greatly dilated. Nature had attempted to compensate for the deficient aeration of the blood. The red cells were 200 per cent, and hemoglobin was 100 per cent; therefore the blood had the normal carrying capacity for oxygen.

Phenobarbital in Epilepsy.—Pratt is convinced that more arrests of seizures are established by continued phenobarbital therapy in moderate doses, from 0.2 to 0.4 Gm. daily, than by smaller doses, as from 0.05 to 0.1 Gm. daily. The by and after effects are little more often encountered with the use of moderate doses than with small doses. In the treatment of the epilepsies the dose is limited only by the dosage that can be reached without producing by or after effects. The grand mal attacks are more amenable to this therapy than the petit mal. The cessation of attacks checks the mental deterioration associated with continued attacks. Though phenobarbital therapy in small doses is occasionally accompanied by an increase of epileptic attacks, larger dosage often results in an arrest in these cases. The sane epileptic patient, if the seizures are arrested for a considerable period of time, is again fit to lead a more or less normal existence. As phenobarbital therapy is a palliative rather than a curative measure, it should not supplant attention to general hygienic measures and to improvement in the patient's general physical health and regular habits or other medicinal treatments as indicated, in the endeavor to bring about permanent arrest of the attacks.

Pneumococcic Meningitis.—Five cases of pneumococcic meningitis are reported by Kennedy, all of which were fatal. The etiologic factors in this series were: (*a*) fracture of the base of the skull; (*b*) paranasal sinusitis and mastoiditis; (*c*) so-called primary cryptogenic meningitis; (*d*) a septicemia following a frank lobar pneumonia; (*e*) a primary septicemia. In two cases there was acute endocarditis of pneumococcal origin. One case showed general pneumococcus infection without localization in the lungs. One case of fatal general pneumococcus infection occurred even after almost complete resolution of the primary pneumonic lung. A rare complication was metastatic panophthalmitis.

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Complete Prolapse of Rectum. W. E. Person, Atlanta.—p. 400.

Illinois Medical Journal, Oak Park

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Physical Therapeutic Methods in Otolaryngology. A. R. Hollender and M. H. Cottle, Chicago.—p. 191.
*Chronic Arthropathies. C. P. Emerson, Indianapolis.—p. 196.
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Management of Second and Third Stages of Labor. G. F. Hibbert, Chicago.—p. 209.
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Management of Eclamptogenic Toxemia. F. H. Falls, Chicago.—p. 224.
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Interpretation of Doubtful Wassermann Reaction. F. B. Lusk, Chicago.—p. 237.
Etiology and Treatment of Neuroses. M. Sherman, Washington, D. C.—p. 240.

Chronic Arthropathies.—Emerson reports the results of treatment of cases of chronic arthritis as follows: 43 per cent improved much, 38 per cent improved slightly, and 19 per cent improved not at all. In the treatment one of the most important general measures is psychotherapy. The patient's worries must be relieved; the patient must be encouraged. He must undertake with enthusiasm physical exercises which are disagreeable and painful. He must have faith that they will be successful. We often say that the one willing to shed the most tears (on account of pain) will get the best results. He must not be allowed to "stagnate in bed." There is no surer way of making the disease progressive. All definite focal infections should be removed or drained. The diet begins with one week of buttermilk only, at least 4 quarts a day, in an attempt to modify the flora of the bowel. After that the diet is more liberal, and planned as for any patient whom one is trying to "build up." Physical therapy is of great importance. Heat is used in any form, but with the one purpose of relaxing the muscles and diminishing the pain. This is important since, after all, the real therapy resides in the active and passive movements of the affected joints. Anything, therefore, which makes possible more motion is of benefit, and heat is excellent for this. The ultraviolet ray is useful for its general tonic effects. Exercise is required at prescribed intervals, up to the point of fatigue. Exercise, however, does not necessarily mean walking, for one reason the hips, knees and ankles are so often most involved is that the weight of the body is brought to play on these joints with each step. The patient is asked, therefore, to exercise the lower extremities while lying flat on his back in bed, making with them movements similar to the calisthenic movements of the upper extremities. If these exercises are followed by fatigue or pain which lasts more than an hour, or if they cause a little fever, they are discontinued for a while, and then resumed, but with less vigor. Mere pain is no contraindication. All autogenous and all stock vaccines were without definite benefit. Of the medicines Emerson uses amiodoxyl intravenously, acetyl salicylic acid, arsenic and, especially, cod liver oil. The improvement is slow but in the long run the results are encouraging.

Journal of Cancer Research, New York

12: 1-82 (March) 1928

*Early Cancer of Stomach. W. C. MacCarty, Rochester, Minn.—p. 1.
*Increased Mortality Rate of Cancer. H. E. Eggers, Omaha.—p. 9.
*Ovarian Secretion and Tumor Incidence. W. S. Murray, Ann Arbor, Mich.—p. 18.
Experiments on Effect of X-Radiation on Growing Seedings. M. C. Reinhard and K. L. Tucker, Buffalo.—p. 26.

*Evidence that Cancer Is Not Simple Mendelian Recessive. C. C. Little, Ann Arbor, Mich.—p. 30.
Histologic Resemblance of Rous Chicken Sarcoma 1 to Hodgkin's Granuloma. F. A. McJunkin, Chicago.—p. 47.
Opposite Effects of Liver and Pancreas on Growth of Planarian Worms. R. Wulzen and A. M. Bahrs, San Francisco.—p. 53.
Comparison of Quantitative Biologic Effects of Gamma and X-Rays. C. Packard, New York.—p. 60.
Implantation of Rat Carcinoma and Sarcoma Within Benign Fibro-Adenoma. J. Heiman, New York.—p. 73.

Early Cancer of Stomach.—In an experience with 3,374 gastric lesions at operation, MacCarty says he has never seen a small cancer (say 2 mm. in diameter) that was not in the border of a chronic gastric ulcer. This does not mean that every chronic ulcer is, or will become, a cancer. This large experience teaches also that when a chronic ulcer has a small cancer in its border, it does not give differential signs or symptoms by any known clinical method including the roentgen rays.

Cancer Mortality in Canada.—Eggers believes that the death incidence for cancer has grown rapidly. In 1900, it was 63.0 per hundred thousand of population, in 1924, 91.9 per hundred thousand.

Ovarian Secretion and Tumor Incidence.—From Murray's data and from the results of previous investigations with normal breeding females, it is apparent that one of the underlying causes of the occurrence of neoplasms in the females of a certain strain of mice is very definitely linked with the ovary and the activity of its secretions. That the testes do not play a prohibitive part in the absence of tumors in normal and castrated males seems well established.

Cancer Not Mendelian Recessive.—Little feels that the complicated nature of cancer, its long and successful history of menace to the human race, and its social importance, together with the need of increasing the confidence of the medical profession in genetic methods of analysis, justify one in deciding definitely at this time that all forms of cancer in mice are not due to a single and simple mendelian recessive factor and that continued study with more careful genetic analysis than that given by her up to the present time should precede any further development of Slye's data from a genetic point of view.

Journal of Urology, Baltimore

20: 267-367 (Sept.) 1928

Clinical Neurophysiology of Automatic Urinary Bladder and Enuresis. C. F. McClintic, Detroit.—p. 267.
Surgical Pathology of Malformations in Kidneys and Ureters. J. E. Davis, Detroit.—p. 283.
Renal Sympathectomy. E. Hess, Erie, Pa.—p. 333.
Renal Tuberculosis: Healing of Tuberculous Nephrectomy Wounds. B. G. Scholefield, Boston.—p. 345.
Pitfalls in Urography. M. B. Wesson, San Francisco.—p. 355.

Medical Journal and Record, New York

128: 261-320 (Sept. 19) 1928

Treatment of Cancer of Skin with Roentgen Rays, Radium and Electrocoagulation. G. E. Pfahler, Philadelphia.—p. 261.
Medical Treatment of Cancer. R. J. Behan, Pittsburgh.—p. 263.
Functional Relationship Between Complements, Vitamins and Hormones. F. Herb, Chicago.—p. 268.
Oral Therapy in Treatment of Gonorrhea and Other Urinary Infections. A. L. Wolbarst, New York.—p. 272.
Tuberculous Peritonitis. G. C. Burrows, Atlantic City, N. J.—p. 273.
Feeding the Baby. A. Nettelroth, Louisville, Ky.—p. 277.
Fat. J. W. Shuman, Los Angeles.—p. 278.
Constipation. E. E. Cornwall, New York.—p. 283.
Chronic Diarrhea in Adults. J. Schneyer, Philadelphia.—p. 286.
Clinical Value of Roentgen Ray in Gastric Disorders. V. Knapp, New York.—p. 291.
Autointoxication. H. H. Boeker, New York.—p. 293.
Gastro-Enterologic Wards Versus General Wards in Treatment of Gastro-Intestinal Diseases. M. Einhorn, New York.—p. 295.
Modern Standard of Thoroughness in Rectal Examinations. J. F. Montague, New York.—p. 296.

New England J. Medicine, Boston

199: 547-592 (Sept. 20) 1928

Heart During Anesthesia and Operative Procedures. H. M. Marvin, New Haven, Conn.—p. 547.
Chronic Constipation Due to Congenital Stenosis of Anal Canal: Six Cases. T. C. Hill and E. P. Hayden, Boston.—p. 552.
*Traumatic Abscess of Omentum. H. K. Sowles, Boston.—p. 554.
Effect on Their Function of Stretching Nerve Trunks. A. Forbes, Boston.—p. 555.

Traumatic Abscess of Omentum.—While lifting a 40 quart milk can to the height of his shoulder and emptying it into a large vat, Sowles' patient received a severe blow on the abdomen. He immediately suffered very intense pain over the upper portion of the abdomen, more severe on the left side. He sat down for a while and an hour or so later felt so bad that he went home. He remained away from work for a day or two and then returned, but he did not feel well and was unable to do any lifting. A large area of ecchymosis developed just to the left and above the umbilicus. Four days before admission, after lifting a moderate weight, he was suddenly seized with a severe pain in the left lower quadrant. This pain gradually subsided. On the day of admission, without any warning, he suddenly had an attack of very intense pain in the left lower quadrant followed at once by vomiting and later by chills. Although there was no definite past history of gastric disturbance, a diagnosis of acute perforation of the duodenum or possibly of the appendix was made. Because the diagnosis was not absolutely certain, incision was made through the right rectus muscle just opposite the umbilicus. Some purulent fluid was found in the peritoneal cavity. Examination of the stomach and duodenum did not show any gross pathologic changes. Therefore, the incision was extended downward and it was found that there was more purulent fluid in the pelvis than in the upper abdomen. The appendix was adherent behind the cecum and was injected, but there was not enough inflammation to account for the symptoms. On exploring toward the left side of the abdomen, an inflammatory mass as large as a baseball was found. This mass was adherent to the under side of the abdominal wall directly beneath the site of the external discoloration. It was freed from the abdominal wall by dissection with the fingers and was drawn up into the incision. It proved to be a mass of omentum and thick yellow pus was oozing from a small perforation on its posterior surface. The whole mass was excised. Postoperative convalescence was slow but uneventful. The postoperative diagnosis was traumatic abscess of the omentum with acute perforation into the abdominal cavity.

New York State J. Medicine, New York

28: 1087-1146 (Sept. 15) 1928

Factors in Infant Mortality Problem. C. Herman, New York.—p. 1087.
Painless Coronary Occlusion. A. M. Wedd, Clifton Springs.—p. 1091.
Relative Intensity of Distribution of Ragweed Pollen During a Period of Three Years. S. J. Parlato, Buffalo.—p. 1095.
Medical Society's Share in Protecting Children of Schenectady Against Diphtheria. H. A. Gilmartin, Schenectady.—p. 1097.
Cancer Situation in State of New York: III. Hospital Facilities for Diagnosis and Treatment of Cancer. J. M. Swan, Rochester, N. Y. —p. 1100.
Lymphocytosis: Its Clinical Importance. K. R. McAlpin, New York. —p. 1103.
*Connection with Epilepsy and Some Diseases of Childhood. H. A. Patterson, Sonyea, and S. M. Weingrow, New York.—p. 1106.
Radiographic Aids in Diagnosis of Diseases of Esophagus and Cardia. J. R. Carty, New York.—p. 1111.

Connection Between Epilepsy and Whooping Cough.—The influence of whooping cough, if it has any, on the age of onset of the epilepsy is uncertain, for the results noted by Patterson and Weingrow show an apparent contradiction between the effect of whooping cough on the onset when it occurs alone and when it occurs in combination with other childhood diseases. In their series a greater number of grand mals per given period was found with whooping cough than with any other of the childhood diseases studied. As the coagulation time is accelerated in epilepsy, excessive bleeding is not likely to occur. The lymphocytic leukocytosis often present in epilepsy must be taken into account in interpreting the blood picture of pertussis when there is also a lymphatic leukocytosis. The possibilitiy of an eosinophilia in epilepsy must be borne in mind in interpreting the blood picture in children when scarlet fever, worms, parasites or urticaria is being considered. In the authors' group, the coagulation and bleeding times, the total white count and the differential count fail to show the existence of any definite relationship between epilepsy and the diseases of childhood and infancy studied.

Philippine Journal of Science, Manila

36: 271-369 (July) 1928

Bacterial Fruitlet Brown-Rot of Pineapple in Philippines. F. B. Serrano, Manila.—p. 271.
Trematode Parasites of Philippine Vertebrates. M. A. Tubangui, Los Baños.—p. 351.

Public Health Reports, Washington, D. C.

43: 2459-2517 (Sept. 21) 1928

Epidemiology of Undulant (Malta) Fever in Iowa. A. V. Hardy.—p. 2459.

Radiology, St. Paul

11: 271-360 (Oct.) 1928

Plea for Standardization of Technic in Oral Method of Cholecystography. W. H. Stewart and H. E. Illick, New York.—p. 271.
Bone Diseases. W. W. Belden, New York.—p. 281.
Osteochondritis Dissecans. M. J. Geyman, Santa Barbara, Calif.—p. 315.
*Radiotherapy in Actinomycosis. A. U. Desjardins, Rochester, Minn.—p. 321.
Fusospirochetal Pulmonary Gangrene: Two Cases. H. P. Doub, Detroit.—p. 333.
Autogenous Bone Graft in Spondylolisthesis. F. H. Albee, New York.—p. 340.

Intra-Abdominal and Intrathoracic Actinomycosis.—Approximately thirty proved cases of intra-abdominal or intrathoracic actinomycosis observed at the Mayo Clinic are analyzed by Desjardins. In twenty-six cases the disease affected chiefly the intestinal or pelvic structures or both. The pulmonary apparatus or thoracic structures were the principal seat of the disease in eleven cases, and in seven the lesions were in both the thorax and the abdomen. Of the twenty-two cases in which the initial symptoms were related to the abdomen, simple appendectomy or drainage of a so-called appendiceal abscess had been carried out in sixteen, and in two of those there had been drainage of pelvic abscesses also, without the character of the lesions having been recognized. In one of these cases the symptoms of appendiceal inflammation started soon after herniotomy, and it is surmised that the lesion which led to this operation may have been related to the actinomycotic process. The treatment in most cases consisted of a combination of drainage, the administration of iodides internally, and roentgen irradiation of the abdomen or thorax. Radium treatment was also given in eight cases at some time during the subsequent course of the disease. In eleven cases drainage or any other surgical intervention was not required. If the lesion was situated in the abdomen, roentgen rays were applied from the level of the xiphoid cartilage to that of the lower border of the pubis, generally through four anterior and four posterior fields. Desjardins says it is probable that drainage alone or in conjunction with the use of iodides may have influenced the subsequent improvement of some of the patients; but, in view of the well known influence of irradiation on actinomycotic processes, it is likely that the chief factor in the improvement noted in some of these cases must be credited to irradiation. A very detailed analysis of these cases is given.

South Carolina M. Association Journal, Greenville

24: 201-224 (Sept.) 1928

Technic and Interpretation of New and Rarely Used Laboratory Tests. W. G. Gamble, Jr., Charleston.—p. 203.
Conduct of Labor and Use of Anesthetics. L. A. Wilson, Charleston.—p. 206.
Recurring Head Colds. T. R. Gaines, Anderson.—p. 208.

Surgery, Gynecology and Obstetrics, Chicago

47: 289-448 (Sept.) 1928

Spinal Cord Surgery. E. Sachs, St. Louis.—p. 289.
*Teratomatous Cysts of Spinal Cord. L. S. Kubie and J. F. Fulton, Boston.—p. 297.
Original Features in Arthroplasty of Knee with Improved Prognosis. F. H. Albee, New York.—p. 312.
*Autotransplantation of Endometrium in Eye of Rabbits. E. Allen and C. P. Bauer, Chicago.—p. 329.
*Adult Human Endometrium in Tissue Culture. H. F. Traut, Baltimore.—p. 334.
Chondrodysplasia (Ollier's Disease). M. Cleveland, New York.—p. 338.
*Multiple Polyposis of Colon: Case. H. E. Hullsiek, St. Paul.—p. 346.
Hematometra: Twenty-Three Cases. H. E. Simon, Rochester, Minn.—p. 356.
Billroth I Resection of Stomach. V. Orator, Duesseldorf, Germany.—p. 368.
Arthrotomy of Hip. N. Allison, Boston.—p. 375.
*Gastro-Enterostomy with Transverse Jejunal Incision. T. S. Moise, New Haven, Conn.—p. 383.
*Suprarenal Apoplexy; Bilateral. F. Pearl and H. Brunn, San Francisco.—p. 393.
Appendiceal Peritonitis. J. B. Deaver, Philadelphia.—p. 401.
*Clinical Significance of Choked Disks Produced by Abscess of Brain. W. I. Lillie, Rochester, Minn.—p. 405.
*Horsley Pyloroplasty in Acute Perforated Duodenal Ulcers. J. W. Hinton, New York.—p. 407.
*Restoration of Female Urethra and Vesical Sphincter: Operative Technic Resulting in Urinary Control. W. H. McGaw and M. Douglass, Cleveland.—p. 408.
Bladder Tumors: Therapeutic Measures Best Suited to Different Types. W. A. Frontz, Baltimore.—p. 413.
Acute Intestinal Obstruction Due to Impacted Gallstones: Four Cases. J. H. Powers, Boston.—p. 416.

Teratomatous Cysts of Spinal Cord.—Two cases of teratomatous cysts of the spinal cord are described by Kubie and Fulton, which were successfully removed at operation. Both contained ciliated cells. The first patient, a child, aged 2 years, who came under observation because of irritability and "tender" abdomen, had always dragged its right foot. Repeated lumbar punctures at the level of the tenth and eleventh dorsal vertebrae gave thick "egg-white" fluid filled with ciliated cells. At operation a large flattened cyst was found extending from the tenth dorsal to the fourth lumbar vertebra. Histologically it proved to be a relatively simple teratoma lined with ciliated columnar epithelium. The child recovered and became symptom-free. The second patient, an unmarried American woman, aged 27, had had five attacks of left hemiplegia with pain in the left cervical region and Brown-Séquard dissociation of sensation in the trunk and extremities (pain and thermic sense absent on the right, loss of position sensation on left with astereognosis) at varying intervals since the age of 2. Her present attack developed into an almost complete quadriplegia with an upper level of sensory disturbance at the fourth cervical vertebra and grave embarrassment of respiration. A cyst filled with mucus and ciliated cells attached to the left side of the cord at the level of the third and fourth cervical vertebrae had been removed previously. Histologically this cyst was found to be a more complex teratoma than the preceding, with changes compatible with its greater age. After operation, the patient had an immediate and dramatic recovery of power with marked though less complete return of sensation. Both cysts were congenital and probably represent ependymal diverticula of the central canal of the spinal cord.

Autotransplantation of Endometrium into Eye.—Allen and Bauer transplanted bits of endometrium and testis into the abdominal wall and the anterior chamber of the eyes of rabbits. The result was that the epithelium of the endometrium in rabbits showed a marked tendency to proliferate. This proliferated epithelium tends to retain its secretory ability and reproduces glandlike spaces and cystic cavities. The ability to invade other tissue is not so marked as its tendency to proliferate but seems to be quite definite. Ectopic endometrial epithelium did not tend to produce a connective tissue reaction in these transplantations. Endometrium transplanted to the eye of rabbits will undergo the same decidual reaction as takes place in the pregnant uterus. Transplanted endometrial stroma and uterine musculature remain viable for long periods of time without showing any tendency toward further growth. Testicular or peritoneal epithelium did not show a similar ability to proliferate or invade. The abdominal wall does not seem to favor the survival of implanted tissue in rabbits.

Artificial Culture of Endometrium.—Human endometrium has been grown successfully by Traut for as long as twenty days in vitro. Sterile endometrium was carefully washed in several changes of Ringer's solution to free it of all possible traces of blood. The issue was cut into very small fragments. These were transplanted into a medium composed of two parts: one part was solid and formed from a fibrinogen suspension and dilute embryonic extract containing a trace of sodium linoleate to prevent digestion of the clot; the other part was fluid and was composed of tyrode solution. The fibrinogen suspension was introduced first, being diluted with an equal volume of tyrode solution, so that the whole volume was 1 cc. Tyrode solution, 0.5 cc., containing a trace of sodium linoleate, and 0.5 cc. of dilute embryonic extract were then added. The fragments of endometrium were carefully placed in the medium, equidistant from one another, before coagulation took place. The medium was then allowed to solidify and 1 cc. of tyrode solution was added. Before the implantation of the tissue was done, the medium was carefully tested to determine the hydrogen ion concentration, and the necessary modification was made. The hydrogen ion concentration was maintained at approximately 7.2. The fluid medium was changed every day and replaced by fresh tyrode solution. The use of fibrinogen sus-

pension as the source of the clot was adopted when it was found that the small trace of serum remaining in the clots formed from plasma was inhibitory, even after repeated washings. At various stages cultures were fixed, stained, and mounted for microscopic study. It was found that the growth occurred almost wholly from the stromal or connective tissue portions of the explant. The epithelial cells apparently had such a long latent period that they were overgrown by the stroma cells. This gave an almost pure strain of connective tissue cells on the periphery of the cultures, and by carefully sectioning a culture so as to obtain only the peripheral cells it was possible to obtain pure strains of stroma cells. When corpus luteum extract was used in place of the embryonic extract, there was a most luxuriant and rapid growth of the cells, equaling and in some instances exceeding the rate of growth in the cultures containing the embryonic extract.

Multiple Polyposis of Colon.—Hullsiek reviews 127 cases on record and reports one new case. He says that there is a definite hereditary tendency. The mortality is high, 47.2 per cent under all forms of treatment. The treatment is not yet standardized.

New Technic for Posterior Gastrojejunostomy.—Posterior gastrojejunostomy with transverse jejunal incision has been done by Moise in twenty-three instances, including seventeen in which the procedure was utilized as the operation of choice and six for palliative relief of pyloric obstruction in malignant disease. The immediate convalescence was surprisingly uneventful in the entire series. There was no postoperative vomiting whatever in eleven of the seventeen cases; in five there was slight vomiting following the operation but complete relief was obtained after gastric lavage. In one case only slight vomiting persisted off and on while the patient remained in the hospital.

Bilateral Suprarenal Apoplexy.—The sole symptom in the case reported by Pearl and Brunn was a severe, tearing, nonradiating pain in the kidney region. Occasionally, a few red blood cells were found in the urine. A diagnosis was not made. Finally, the temperature rose. The abdomen was slightly distended. The right rectus was a little guarded in its upper portion. There was tenderness to pressure in the gallbladder region, but there was no tenderness at this time in the right or left costovertebral angles. The patient complained of pain along the vertebrae between the scapulae. The possibility was considered of hemorrhage into a retroperitoneal tumor with secondary necrosis. The patient became mentally dull, incoherent, profoundly asthenic, and depressed out of all proportion to the temperature, blood count and physical conditions. The pulse was rapid in contrast to the rather low grade fever, but the blood pressure was 120 systolic and 80 diastolic, and there were no obvious signs of circulatory failure. He preferred to lie on his back. The nurse had noted that being on the right side caused distress and occasional hiccup. There were no causes above the diaphragm to account for the general condition or abdominal symptoms. Aside from considerable tenderness deep in the right hypochondrium and less marked tenderness along the course of the pancreas, nothing was found. The patient's blood pressure fell to 90 and then to 60 and he became extremely difficult to arouse. The respirations climbed to 40 and then to 55, with periods of Cheyne-Stokes type. The pulse became very rapid and then imperceptible. Death occurred twelve days after the onset of symptoms. At postmortem examination both suprarenal glands were found to be enlarged, the seat of massive hemorrhage which destroyed the entire architecture of the gland, sparing only a small, gold brown rim of cortex about 1 mm. wide.

Choked Disks in Abscess of Brain.—Lillie points out that the ocular syndromes produced by an encapsulated brain abscess are the same as those produced by a brain tumor similarly situated. Choked disks in cases of cerebellar abscess have less elevation than those produced by cerebellar tumors. The presence of choked disks in cases of intradural suppuration does not always signify the presence of brain abscess. Rapidly developing choked disks in cases of brain abscess are significant of a changing cerebral process, and intracranial operations during this period give unsatisfactory results. Stationary choked disks in cases of brain abscess observed over a short period of time indicate encapsulation. Intracranial operations during this period give excellent results. Repeated ophthalmoscopic examination of choked disks in cases of brain abscess is of great prognostic value.

Results of Horseley Pyloroplasty.—In Hinton's series of twelve cases there was one death, and two patients cannot be traced. Two patients have remained entirely well to date, one for a period of three years, and the other for three and one-half years. One patient had a definite recurrence and another a pyloric stenosis which necessitated a gastroenterostomy. Five patients were not symptom-free and could not be classed as having satisfactory surgical results. This leaves nine patients who have been followed, or a total of 22 per cent who are entirely well following this type of operation. In view of these results, Hinton thinks one does not seem justified in continuing to use this type of operation.

Restoration of Female Urethra.—McGaw and Douglass recommend the use of levator muscle transplants in the repair of vesical sphincter defects in the female.

Texas State J. Medicine, Fort Worth

24: 327-384 (Sept.) 1928

Plastic Surgery of Orbit. A. G. Wilde, Fort Sam Houston.—p. 336.
Retroperitoneal Tumors. H. Smith, Marlin.—p. 345.
Diagnosis and Treatment of Spontaneous Pneumothorax. R. H. Homan, El Paso.—p. 349.
Value of Slit Lamp Microscopy. E. L. Goar, Houston.—p. 352.
Malignancy of Orbit and Accessory Sinuses. H. T. Aynesworth, Waco. —p. 354.
Vaginal Mycoses. E. L. Heard, Houston.—p. 357.
Rôle of Kahn Test in Diagnosis of Syphilis. W. C. Cox, Fort Sam Houston.—p. 359.
Prophylaxis of Diphtheria. B. Reading, Galveston.—p. 366.
Irritable Myocardium in Syphilitic Patients L. V. Ragsdale, Birmingham, Ala.—p. 368.
Narcolepsy. M. G. Pearce, Houston.—p. 371.

Virginia Medical Monthly, Richmond

55: 367-442 (Sept.) 1928

Attitude of Public Toward Medical Profession. S. Leigh, Norfolk.—p. 367.
Some Stomachs I Have Met. J. S. Horsley, Richmond.—p. 370.
Treatment of Massive Collapse of Lung. R. H. Meade, Jr., and V. W. Archer, University.—p. 378.
Course and Treatment of Coronary Artery Occlusion. L. T. Gager, Washington, D. C.—p. 381.
Infantile Diarrheas. T. D. Jones, Richmond.—p. 385.
Diphtheria Control in Virginia. H. G. Grant and D. H. Anderson, Richmond.—p. 390.
Infected Tonsils as Factor in Etiology of Rheumatism. M. Edmunds, Petersburg.—p. 396.
Postoperative Care. H. H. Kerr, Washington, D. C.—p. 398.
Abortion. C. H. Lupton, Norfolk.—p. 401.
Teeth a Source of Focal Infection. C. D. Townes, Waverly.—p. 405.
Treatment of Eclampsia and Allied Conditions. P. Harris, Scottsville. —p. 409.
Some Common Types of Infantile Diarrhea; Principles Underlying Diets Used in Their Treatment. B. B. Jones, Richmond.—p. 411.
Treatment of Neurosyphilis. J. T. N. McCastor and M. C. McCastor, Thomas, W. Va.—p. 415.

West Virginia M. Journal, Charleston

24: 477-528 (Oct.) 1928

Treatment of Diabetes Mellitus. E. P. Joslin, Boston.—p. 477.
Transfusion of Blood. C. L. Woodbridge, Montgomery.—p. 483.
Discussion and Demonstration of Kahn Test for Syphilis. R. S. Spray, Morgantown.—p. 486.
Surgical Treatment of Certain Infections. J. C. Mitchell, Washington, D. C.—p. 489.
Acute Surgical Mastoiditis. S. S. Hall, Buckhannon.—p. 493.
Sarcoma of Tonsil. E. C. Hartman, Parkersburg.—p. 497.
Acute Pulmonary Abscess: Two Cases Treated by Artificial Pneumothorax. B. F. Brown, Huntington.—p. 498.
Acute Carditis and Subacute Bacterial Endocarditis. J. W. Gilmore, Wheeling.—p. 502.
Broken Compensation and Heart Failure. C. O'Grady, Charleston.—p. 507.

Wisconsin Medical Journal, Milwaukee

27: 397-438 (Sept.) 1928

Exophthalmic Goiter: 300 Cases. A. S. Jackson, Madison.—p. 397.
Bronchial Asthma: Nasopharyngeal Pathology. I. S. Kahn, San Antonio, Texas.—p. 402.
Interstitial Hernia: Case. S. K. Beigler and H. O'Brien, Madison.—p. 407.
Intramural Carcinoma of Dome of Bladder: Case. I. R. Sisk, Madison. —p. 409.
Scarlet Fever: Ricinoleated Antigen in Prevention. E. J. Campbell, Oshkosh.—p. 411.
Time Element in Diagnosis of Early Clinical Tuberculosis of Lungs. A. A. Pleyte, Milwaukee.—p. 413.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

Archives of Disease in Childhood, London

3: 179-226 (Aug.) 1928

*Levulose Tolerance of Convalescent Children: Rheumatism. R. T. Chadwick.—p. 179.
*Coarctation of Aorta with Ulcerative Aortitis. F. J. Poynton and W. P. H. Sheldon.—p. 191.
*Lobular and Lobar Pneumonia in Infancy and Childhood. O. Somerville.—p. 194.
*Arsenic in Treatment of Chorea. S. Graham.—p. 206.
*Etiology of Hirschsprung's Disease. J. A. M. Cameron.—p. 210.
*Heart Block Associated with Congenital Heart Disease. M. E. Lampard. —p. 212.
*Heart Block Associated with Congenital Malformation of Heart. G. B. Fleming and M. M. Stevenson.—p. 221.

Levulose Tolerance of Convalescent Children.—Details are given by Chadwick of levulose tolerance tests carried out on healthy control children, and on children with active disease, especially rheumatism. Figures are given to show that in the healthy child, the child suffering from simple chorea and the child who has recovered from rheumatism, administration of levulose has little or no effect on the blood sugar. In the child with active rheumatism, with or without heart disease, and in the child with chorea and heart disease, there is an appreciable intolerance to levulose. The suggestion is made that intolerance to levulose is due to toxic absorption from some focus of rheumatic infection.

Coarctation of Aorta with Ulcerative Aortitis.—Poynton and Sheldon believe that their patient is the youngest example that has been reported of infective aortitis complicating coarctation of the aorta. The patient was 8 years of age, and died after an acute illness lasting only seventeen days. During this period hemolytic streptococci were isolated from the blood. Autopsy confirmed the suspicion that there was a coarctation of the aorta, and revealed a patch of ulcerative aortitis just beyond the site of the constriction. In addition, the aortic valve was found to be bicuspid, and there was an abnormal arrangement in the origin of the main arteries from the arch of the aorta.

Pneumonia in Children.—Sixty-five patients with pneumonia were examined by Somerville by histologic methods and a bacteriologic examination was made in some of them. Only one case of typical lobar pneumonia was found, this being in a boy of 5 years, but two atypical lobar forms were found in children of 1 and 2 years and in one of these there was, in addition, a lobular lesion in the other lung. Of thirty-five cases of acute primary pneumonia examined, sixteen showed typical lobular lesions; fourteen were diffuse with a lobar distribution in one lobe, but easily differentiated on microscopic examination, and the remaining five were mixed types with features of both lobar and lobular forms occurring in the second and third years of life. In the eighteen secondary cases, the lesions were typically lobular in distribution and in their histologic features. The influenzal cases showed characteristics of an intensely virulent infection. The lungs were extensively involved, six of the eleven cases showing almost a lobular distribution, but the consolidation was always lobular in nature. Pure pneumococcal infections occurred in both lobar pneumonia and primary bronchopneumonia, but in many cases the pneumobacillus, streptococcus and staphylococcus were also found, and in secondary and influenzal forms a mixed infection was invariable.

Value of Arsenic in Chorea.—In forty-five cases treated by Graham, it would not appear that the course of chorea was influenced by arsenic preparations. The improvement, if any, probably results from its tonic action and is not in proportion to the amount of arsenic given. Intravenous arsenic has no advantages. Rest in bed and freedom from emotional disturbances will usually cause a disappearance of chorea in four or five weeks. The administration of sodium salicylate is recommended in the hope that it might have some good effect on the rheumatic infection.

Etiology of Megacolon.—Cameron believes that congenital dilatation of the colon is exactly comparable in its pathologic basis to cardiospasm. A destructive lesion of the nerve ganglions at the pelvirectal sphincter will act as a direct obstacle to the descending peristaltic waves. Above it stasis of the contents will take place, and in an attempt to expel the accumulated and unaccustomed burden, the wall, and especially the principal contracting part of it, the circular muscle layer, will hypertrophy. The initial cause of the condition may be found in some inflammatory lesion of the rectum or anus, but as most of these cases are congenital, the probability is that meconium, retained in the relatively long and lax pelvic colon of the newly born, undergoes bacterial decomposition and sets up inflammatory changes in the mucosa. The inflammatory cells in their outward spread involve the ganglions, and an interruption of peristalsis results. Once a balance is struck between the distending bowel and the hypertrophy of its wall, a return to normal conditions is attempted, and at the sphincter the mucosa and muscular layers may recover from the inflammatory process, while the more highly organized layer of nervous tissue fails.

Heart Block Associated with Congenital Heart Disease.—Lampard reports a case of heart block, probably of a congenital origin. This heart block is usually associated with an anomaly of the interventricular septum. It is probably due not so much to a hole in the septum as to the presence of fibrous tissue causing pressure on the bundle of His. When there is a hole in the septum, the bundle may run on the edge thereof and be liable to injury by inflammation, causing partial destruction of the septum, in rheumatic fever, syphilis and possibly diphtheria. When patients with this disease lead comparatively normal lives they are liable to sudden death.

Heart Block with Congenital Malformation of Heart.—Two cases of heart block in congenital deformity of the heart are described by Fleming and Stevenson. In one the block was complete and in the other it was partial. In neither case was the block of nervous origin. Cyanosis and dyspnea were present in one case but not in the other. The probable lesions were patent interventricular septum and maldevelopment of the auriculoventricular bundle, though in both cases there may have been other cardiac deformities.

British J. Experimental Pathology, London

9: 161-224 (Aug.) 1928

Preparation of Gold Sols for Lange Tests: New Method. F. S. Fowweather.—p. 161.
*Influence of Dietetic Factors on Intensity of Symptoms Produced During Acute Experimental Nephritis. S. J. Cowell.—p. 164.
Resistance of Streptococcus Faecalis to Acid and Alkaline Mediums. A. W. Downie and J. Cruickshank.—p. 171.
*Supposed Relationship Between Viruses of Herpes Febrilis and Vaccinia. S.P. Bedson and J. O. W. Bland.—p. 174.
Experiments and Observations on Contact of Animal Tissue with Mercuric Iodide Dissolved in Aqueous Potassium Iodide. H. Candy and W. Bulloch.—p. 179.
Action of Vibrion Septique and B. Welchii Toxin on Isolated Organs. G. A. H. Buttle and J. W. Trevan.—p. 182.
Preparation of Antigenic Specific Substance from Staphylococcus Pyogenes-Aureus. H. B. Day.—p. 198.
Rough and Smooth Strains of Corynebacterium Diphtheriae on Trypsin-Serum-Agar. H. B. Parker.—p. 207.
Cataphoresis Experiments with Virus of Vaccinia. S. R. Douglas and W. Smith.—p. 213.
Propagation of Vaccine Virus in Rabbit Dermis. J. C. G. Ledingham and D. McClean.—p. 216.

Diet in Experimental Nephritis.—Cowell asserts that a diet composed entirely of cabbage affords considerable protection from the severe toxic effects that may be produced by small doses of uranium nitrate in rabbits fed on an ordinary laboratory diet of oats, bran and a small allowance of green food. Some evidence is offered for the suggestion that this protective effect of the cabbage diet is not due to its low protein content nor to its capacity for producing an alkaline urine. Attempts have been made to separate from whole cabbage some fraction which contains a protective factor, and though the evidence is not completely conclusive, such a factor appears to be present in a watery extract, and may possibly exist in a dialyzed watery extract.

Relation Between Herpes and Vaccinia Viruses.—The results obtained by Bedson and Bland in a considerable number of experiments on animals have convinced them that the viruses of vaccinia and herpes febrilis are unrelated.

British Journal of Radiology, London

1: 257-292 (Aug.) 1928

Some Effects of Roentgen Radiation on Blood: I. Measurement and Distribution of Radiation. W. V. Mayneord.—p. 257.

Journal of Hygiene, London

28: 1-104 (Aug.) 1928

Stability of Schick Toxin. A. Joe and J. C. J. McEntee.—p. 1.
Investigation of Bacillus Dysenteriae (Sonne Type III). J. C. Kerrin. —p. 4.
Causation of Malignant Disease. A. Eastwood.—p. 9.
Epidemiologic Contribution to Knowledge of Respiratory Diseases. J. J. van Loghem.—p. 33.
Use of Preserved Bacterial Suspensions for Agglutination Test: Typhoid and Typhus Fever. A. Felix and L. Olitzki.—p. 55.
Furunculosis in Trout and Importance of Carriers in Spread of Disease. J. H. Horne.—p. 67.
Distribution of Bacillus Botulinus in Scottish Soils. G. Leighton and J. B. Buxton.—p. 79.
Skin Tests for Susceptibility to Measles. J. Smith and A. M. Fraser. —p. 83.
Frequency of Appearance of Tubercle Bacilli in Feces of Three Apparently Healthy Cows. R. S. Williams and W. A. Hoy.—p. 89.
Dangers of Certain Mineral Baking Powders Based on Alum, When Used for Human Nutrition. G. Schaeffer and others.—p. 92.
Mule Spinners' Cancer: Time Necessary for Its Production. S. A. Henry.—p. 100.

Journal of State Medicine, London

36: 497-558 (Sept.) 1928

Bacteriology in Connection with Forensic Medicine. R. Donaldson.—p. 497.
Principles of Epidemiology. C. O. Stallybrass.—p. 510.
Bacterial Examination of Water in Public Swimming Baths. G. K. Bowes.—p. 521.
Medical Tour to Hospitals of Paris and Certain French Spas. T. N. Kelynack.—p. 546.

Lancet, London

2: 485-534 (Sept. 8) 1928

Recent Advances in Our Knowledge of Rickets and Allied Diseases. L. G. Parsons.—p. 485.
*Bone Formation and Osteoblast. H. A. Harris.—p. 489.
*Cancer of Intestine. R. Warren.—p. 493.
*Therapeutic Action of Plasmochin and Plasmochin Compound in Malaria. P. Manson-Bahr.—p. 496.
*Splenic Anemia and Portal Thrombosis. J. C. Davies.—p. 498.
Case of Cervical Rib. G. A. Dunlop.—p. 500.
Normal Birth of Child Weighing Sixteen Pounds. F. R. Parakh.—p. 500.
Case of Rupture of Spleen After Artificial Induction of Malaria. N. G. Harris.—p. 500.

Bone Formation.—Harris concludes by stating: It seems that until the chemist explains the colloidal processes which lead to the deposition of the salts of calcium in two tissues so fundamentally distinct as dying cartilage, on the one hand, and living bone on the other, we must continue to regard the osteoblast as a splendid being, endowed with genius, sensibility and intelligence, ever ready to perform the work at hand.

Treatment of Cancer of Intestine.—In sixty-nine cases of cancer of the intestine preliminary drainage by colostomy (including cecostomy) or lateral anastomosis was done by Warren in fifty-seven; in the other twelve the operation was primary excision and anastomosis. Of the forty-three patients who survived colostomy or anastomosis, excision of the growth was done in twenty-four, and sixteen recovered. As far as possible, the rule was followed of not resecting at the primary operation when any obstruction was present. In some special circumstances this rule was broken, and not always with bad results. Taking it all round, patients did far better after secondary than after primary excision, the mortality being 30 per cent as against nearly 60 per cent. Warren says that there is a great temptation to try to get the matter finished with as few operations as possible, especially in aged patients, but experience shows that persons over 70 stand the extra time in bed, needed for a second and third operation (excision and closure of colostomy), quite well. Colostomy, though a relatively minor operation, has a sufficiently high mortality; in this series it was 20 per cent, which was partly caused by complications. In several other patients the cecum was gangrenous or perforated; not all of these succumbed. In another patient a suppurating ovarian cyst rendered the preliminary colostomy and excision difficult and presumably inadequate, as recurrence took place. About a year later another inflamed ovarian cyst on the opposite side further complicated the condition.

Value of Plasmochin in Malaria.—Manson-Bahr is of the opinion that sufficient evidence has now been accumulated to show that, under certain circumstances, plasmochin can act as an efficient substitute in patients who have been susceptible to, or intolerant of, large doses of quinine. Its most important property is that it affords an alternative treatment and is undoubtedly tolerated in severe cases with persistent vomiting when pure quinine is not. The amount of the drug necessary to banish the parasites from the blood is much smaller—a very important point—the taste is not disagreeable, the effects on digestion are negligible, and it is well tolerated by children. Occasional signs of relative intolerance to plasmochin and plasmochin compounds are slight cyanosis, dyspepsia, colic and splenic pain.

Splenic Anemia and Portal Thrombosis.—The relationships between splenic anemia, Banti's disease and portal thrombosis are discussed by Davies. The classic view of Banti, and later of Leon-Kindberg, is summarized, and contrasted with that of Warthin. Two cases of anemia with splenomegaly associated with portal thrombosis are described in detail. Reasons are given for believing them to be examples of primary splenomegalic anemia (which therefore exists) rather than of thrombotic splenomegaly. For this reason it is suggested that they may meet Warthin's challenge. Rosenthal's work on the platelet content of the blood in Banti's disease is mentioned, and an attempt is made to correlate this with the tendency to thrombosis.

Medical Journal of Australia, Sydney

2: 195-224 (Aug. 18) 1928

Diagnosis and End-Results of Tuberculosis of Hip Joint. C. J. O. Brown. —p. 196.
Choice of Anesthetic. G. Brown.—p. 202.
*Unusual Gallbladder Condition. K. S. Cross.—p. 209.
*Abnormal Early Uterine Pregnancy. H. Woollard and J. B. Dawson. —p. 210.
Stricture of Esophagus. P. L. Hipsley.—p. 211.

Gallbladder Disease with Unusual Symptoms.—A man, aged 39, complained of attacks of indigestion occurring irregularly for years. He was seized by sudden acute pain in the right epigastric region, extending over the upper part of the abdomen. It was deep and boring. Reaching a maximum, it was relieved by vomiting, but it returned intermittently. There was considerable progressive jaundice and the patient became "sore" over the gallbladder area. There was no shoulder pain. Initial films of the gallbladder region were taken by Cross prior to the projected oral administration of capsules of sodium tetraiodophenolphthalein. A gallbladder shadow of extreme density presented itself. It was of normal size and contour and of uniform radiopacity, except that this was increased at the base. It resembled, in fact, a supercholecystogram. The shadow was actually more intense than that of the adjacent spinal column, and many times greater than that of any cholecystogram. After removal the viscus was found to be filled with a thick greenish mud consisting of cholesterol calcium carbonate and phosphate. A roentgenogram of the organ taken just before it was opened showed a uniform opacity with a dozen or more minute denser particles scattered throughout. It was evidently the agglomeration of these at the lower pole of the gallbladder in the erect posture assumed by the patient that gave the extra basal density in the roentgenograms.

Abnormal Early Uterine Pregnancy.—Among the material obtained by Woollard and Dawson from curettage of a woman for irregular bleeding was a fragment suggesting the presence of an early embryo. Microscopic examination confirmed this opinion. Inquiry fixed the date of her last true menstrual period at thirty-one days prior to admission. Making the usual allowance for the fact that ovulation occurs at the middle of the intermenstrual period, the probable duration of the pregnancy would be about twenty days on admission. The chorionic vesicle, after fixation, in its greatest diameters measured 3.5 by 3.6 by 3.9 mm. This size would make it fall in the group from 16 to 20 days old. The villi were enlarged by the hypertrophy of the stroma. It is suggested that the cause of hydatidiform degeneration is to be found in the regulative control exerted by the embryo on the formation and function of the villi.

Bruxelles-Médical, Brussels

8: 1458-1491 (Sept. 9) 1928

*Pregnancy with Impacted Fibroid. R. d'Ernst.—p. 1458.
Syphilis in Soviet Russia. Ikthemann.—p. 1467.
Clinical Forms of Hypertension. E. Doumer.—p. 1471.

Cesarean Section and Subtotal Hysterectomy in Case of Pregnancy at Term with Impacted Fibroid.—D'Ernst describes a case of pregnancy in a woman, aged 39, with a large, left-sided intraligamentous fibroid impacted in the pelvis. At term cesarean section and subtotal hysterectomy were performed. An unusual feature in this case was the persistence of the menses up to the fifth month of pregnancy; this rendered it necessary to compute the duration of the pregnancy from the size of the fetal skeleton as revealed by roentgenologic examination.

Gazette Hebdomadaire des Sciences Méd. de Bordeaux

49: 577-592 (Sept. 9) 1928

*Ecchymoses in Chronic Leukemia. J. Sabrazès.—p. 579.
Hemiplegia from Cerebral Tuberculoma. F. Leuret.—p. 580.
Seventh Cervical Rib. L. Dubreuil-Chambardel and Henri-Fischer.—p. 583.

Ecchymoses Following Scratching in Chronic Leukemia with Thrombopenia.—In a typical case of chronic leukemia with thrombopenia in a woman, aged 60, Sabrazès found that both lower extremities were covered with ecchymoses and scattered petechiae. The fragility of the superficial vessels of the skin was so great that even moderate scratching produced an ecchymosis. This tendency to form petechiae and ecchymoses on the lower extremities under the influence of microtraumatisms was explained by the prolonged bleeding time (from five to six minutes).

Journal de Médecine de Lyon, Lyons

9: 453-488 (Aug. 20) 1928

Cancer of Stomach Near Cardia. A. Cade.—p. 453.
*Pseudocysts of Pancreas. L. Bérard and A. Cade.—p. 459.
Gastric Chemism. M. Milhaud and Lochon.—p. 463.
Floating Lobes of Liver. A. Cade and R. Chevallier.—p. 473.
Intestinal Parasitism at Lyons. L. Morenas.—p. 481.

Marked Variations in the Volume of Pseudocysts of the Pancreas.—Bérard and Cade report the case of a young man, aged 17, who had a protruding mass the size of a fetal head under the left costal margin and who stated that several months previously this mass had appeared but had disappeared spontaneously after several days. On the basis of roentgenologic and clinical examinations, a diagnosis of cyst, in all probability a pseudocyst, of the pancreas was made and operation was recommended. This, however, was not performed until several weeks later. On one of the days that preceded the intervention, the mass underwent a diminution of volume of more than one half. The spherical swelling which it had caused disappeared, but palpation revealed a round mass between the liver and the stomach. At operation, a typical pseudocyst of the pancreas was found; this was tapped and marsupialized by suturing its edges to the incision in the abdominal wall. Examination of the fluid removed from the cyst showed the presence of both a lipolytic and an amylolytic ferment. Although other cases of variations in the size of pseudocysts of the pancreas have been reported, the variations have never been very striking and have been attributed to physiologic modifications of the neighboring organs (stomach, colon). In this case, however, the authors consider that the only possible explanation of the variations in size is the spontaneous evacuation of a part of the contents of the cyst through the excretory ducts of the gland, and they believe that this probably occurs when the liquid is under a certain pressure.

9: 489-520 (Sept. 5) 1928

*Fetal Syphilitic Osteochondritis. M. Péhu, A. Policard and A. Brochier.—p. 489.
Roentgen and Anatomic Observations in Syphilitic Osteopathies in Infants. M. Péhu and A. Policard.—p. 495.

Diagnosis of Syphilitic Osteochondritis in Fetus.—In ten out of seventeen fetuses expelled before term, Péhu et al. were able to make a diagnosis of syphilis from the roentgenologic, anatomic and microscopic observations. The roentgenologic observations are the same as those observed in syphilitic infants and represent most frequently the first or second of the following four stages of osteochondritis: 1. First stage. The line of ossification is a little wider than it is normally, is intensely and uniformly black, and pursues an irregular course. On the diaphyseal side of this line there is, on the positives, a much lighter zone. Beyond this is the region of normal appearing bony trabeculae. The succession of a black band and a band much lighter than the normal tissue, is of primary importance in the roentgen diagnosis of syphilitic osteochondritis. Another point of great importance is the presence in the flat bones, particularly the scapula and the bones of the pelvis, of a dark line which follows the contour of the bone at about 1 mm. from its edge (double contour). 2. Second stage. This stage is characterized by the presence of parallel bands each being about 1 mm. wide and arranged as follows: a black band, a "decolorized" band, then another black band larger than the first, then a light band, and finally the bony trabeculae. The alternating black and gray bands are wider, are of a deeper shade, and are more irregular than in the first stage. 3. Third stage. It is rather rare to observe in fetuses the complete fracture of the bone in the zone of the metaphysis. 4. Fourth stage. Ossifying periostitis, also, is rare in the fetus. The anatomic changes are the same as those found after birth; from a practical standpoint the most important thing in the macroscopic examination is the demonstration of Wegner's sign, because the diagnosis of syphilitic osteochondritis can be made on the basis of this sign alone. In the microscopic examination of the bones for spirochetes one should remember that the farther one gets from the line of ossification the less are the chances of finding the spirochetes. The results of these three forms of examination of the dead fetus are of importance for the institution of treatment of the mother for the prevention of syphilitic infection in future offspring.

Paris Médical

2: 205-216 (Sept. 8) 1928

New Spirometer of Reduced Volume. H. Nouvion.—p. 205.
*Percussion of Left Auricle. L. Katsilabros.—p. 214.

Percussion of Left Auricle.—In normal subjects, Katsilabros was unable to demonstrate dulness localized exclusively to the left interscapulovertebral space. Likewise in cases of first degree stenosis of the mitral valve, dulness over this area was absent except in the cases in which the thorax was very narrow. In cases of second degree stenosis of the mitral valve, however, incomplete dulness localized exclusively to the left interscapulovertebral space was found frequently. In cases of third degree mitral stenosis this incomplete dulness could easily be demonstrated and its extent could be measured. The area of dulness was not ovoid, as generally described, but had the shape of a half-moon resting on the side of the vertebral column. The dulness was rendered more pronounced when the patient, lying on his back, was so placed that the left half of his thorax projected beyond the edge of the bed. In this position, however, dulness was found in the left interscapulovertebral space of normal individuals, in whom the area varied from 6 to 7 cm. in height and from 2 to 3 cm. in width (percussed with plexímeter); in patients with mitral stenosis the area of dulness was larger, the degree of enlargement being proportional to the degree of stenosis.

Presse Médicale, Paris

36: 1089-1104 (Aug. 29) 1928

Bacteriophage Therapy. H. Grenet and P. Isaac-Georges.—p. 1089.
*Treatment of Gastroduodenal Hemorrhage. X. Delore and J. de Girardier.—p. 1092.
*Targowla Reaction. A. M. Fiamberti.—p. 1094.
Neurorelapses in Syphilis Following Antisyphilitic Therapy. P. E. Morhardt.—p. 1096.

Indications for Surgical Treatment of Gastroduodenal Hemorrhage Due to Ulcer.—Delore and de Girardier recommend that this condition be treated surgically. The time at which the operation is performed is a very important factor. After repeated hemorrhages, a state of intoxication resulting from the resorption of the blood in the gastro-intestinal tract is added to the state of acute anemia. It is extremely dangerous to operate immediately after the hemorrhage, on account of the hemorrhagic shock, or to operate late, on account of the com-

bined anemia and intoxication. Therefore in cases in which the patient is seen during the first hemorrhage, he is given medical treatment until his condition has improved sufficiently to warrant surgical intervention. In the rare cases in which the patient's condition is not improved by medical treatment, operation should nevertheless be performed. In cases in which the patient is seen during one of a series of hemorrhages, surgery is indicated, regardless of the severity of the hemorrhage, because the fact that it recurs is sufficient indication for surgical treatment.

Targowla Reaction in Cerebrospinal Fluid in Syphilis of Brain and Spinal Cord.—In a study of the cerebrospinal fluids of 500 patients with neuropsychosis, Fiamberti performed the Targowla test systematically, together with the following other tests: determination of total protein, leukocyte count, Pandy and Weichbrodt reactions, colloidal mastic reaction, and fixation reaction. In many of these fluids the benzoin reaction, the gold reaction, the Takata and Ara reaction, and the reactions of Nonne-Appelt, Boveri and Noguchi were also performed. A positive Targowla reaction was obtained in all the cases except one case of paresis. In fact, this reaction was more sensitive than the others in several cases of paresis, one of which was in clinical and blood remission. In the other syphilitic conditions of the brain and spinal cord, likewise, the reactions was always positive, except in one case of taboparesis which had been stationary for years. This test, like all of the colloidal reactions in use at the present time, is not absolutely specific for syphilis; positive reactions in nonsyphilitic conditions are obtained about as frequently as with the benzoin and mastic reactions, but less frequently than with colloidal gold. On account of its great simplicity, the short time required to perform it, and the absence of all preparatory manipulations, it is an essentially practical method for the clinician, easy to perform at the bedside of the patient. It is extremely important to use a good reagent; every time that a new paregoric elixir is used, one should verify its value by performing the tests with a control sample.

Schweizerische medizinische Wochenschrift, Basel

58: 813-836 (Aug. 18) 1928

*Connections Between Accident and Tuberculosis of Various Organs. F. Zollinger.—p. 813.
*Acute Cholecystitis Complicating Typhoid in Childhood. A. Ritter and F. Ehrat.—p. 821.
*Results of Cholecystography. R. Flury.—p. 824.
Radiotherapy in Pulmonary Tuberculosis. M. Gähwyler.—p. 828.
Pathogenesis and Treatment of Neurosis. A. Popea and G. Eustatziou. —p. 831.
Menstrual Disturbances Without Changes in Genital Organs. W. Bigler. —p. 833.

Connection Between Accident and Tuberculosis of Various Organs.—Except in the case of meningitis, in which symptoms may appear as early as the third or fourth day after infection, symptoms of tuberculosis appearing in the first week after a trauma point to infection present at the time of the trauma. The infection must take place before the wound resulting from the injury is healed. In tuberculosis of the bones or joints, the symptoms must not appear earlier than the sixth week or later than after one year in the case of the skull, pelvis or spine, six months in the case of the smaller flat bones, the long bones or the joints. To cause pulmonary tuberculosis, a trauma must result in anatomic injury to the pulmonary tissue, which is a rare occurrence in the case of a healthy lung. Symptoms must occur within four months after the injury. Miliary tuberculosis from rupture of a primary focus is more likely to result from general concussion than from open injuries. Poisonous gases have in rare cases caused dissemination of tubercle bacilli. Symptoms appear between ten days and three weeks from the injury. In the case of tuberculous meningitis the trauma must injure anatomically the primary focus, the meninges or both. A causal connection between tuberculosis of a lymph gland and injury to the skin can be considered only when the injury was in the region of the lymph stream and in the absence of healthy glands between the site of injury and the infected gland. If a series of glands are infected, the gland that lies nearest to the site of injury must present the oldest signs of disease. It is possible for a superficial skin lesion to lead to tuberculosis of a bursa mucosa. For the occurrence of tendon sheath tuberculosis, there must be anatomic injury to the tendon sheath or its immediate surroundings. Subcutaneous traumas would have to be such as to cause considerable injury. The infection first becomes manifest after a number of weeks. Six months represents the upper limit. A connection between trauma and tuberculous peritonitis is most probable when the trauma causes demonstrable peritoneal lesions, and the peritonitis developing at the site of these lesions is at first circumscribed. Symptoms should occur before the end of the first three weeks. Tuberculosis of the testis or epididymis is usually secondary to primary disease in the prostate or seminal vesicles. In the rare cases in which trauma plays a rôle, it is such as both to mobilize the bacilli of the primary focus and to localize them in the testis or epididymis. The outside limits for manifestations are three weeks and three months. When latent or open tuberculosis is present in the organism, small traumas are sufficient to give rise to tuberculous inflammation of the eye. The trauma must affect the eye itself. Symptoms appear, at the earliest, seven days after the injury. In the case of the conjunctiva, symptoms do not appear before six weeks; in that of the iris, before five weeks.

Acute Cholecystitis Complicating Typhoid in Childhood.—A case of acute suppurative cholecystitis complicating typhoid in a boy, aged 10, is reported by Ritter and Ehrat. Cholecystectomy was performed and the child recovered after a difficult convalescence. *Bacillus coli* was found in the contents of the gallbladder and in the peritoneal exudate. Typhoid bacilli were not demonstrable. The authors found in the literature thirty cases of acute cholecystitis as complication of typhoid in childhood. It appears that children are more apt to be temporary (two or three months) than permanent carriers of typhoid bacilli. The cholecystitis may occur at any stage of the primary disease. Bile stasis from mechanical or inflammatory factors is the usual cause in the child. The symptoms are often not characteristic. The most important early symptom is increase in pulse frequency. The pain may be circumscribed or radiating. Leukopenia gives place to leukocytosis. A guarded prognosis must be given. Early operation is recommended.

Results of Cholecystography.—Flury reports the results of cholecystography in seventy-seven patients. In twenty-four cases the results could be tested by necropsy. The fact that absence of the shadow denotes a pathologic change (occlusion of the cystic duct) was confirmed. However, Flury's experiences did not confirm the theory that a faint shadow indicates a diseased gallbladder wall.

Clinica Chirurgica, Milan

31: 443-575 (May) 1928

Influence of Vascular Innervation on Collateral Circulation Following Ligation of Large Vessels. I. Scalone and F. Sforza.—p. 443.
*Hemostasis in Goiter Operations. S. Rolando.—p. 496.
*Hemangiomas of Parotid. G. Forni.—p. 504.

Hemostasis in Goiter Operations.—Rolando recalls that, of the untoward incidents that may complicate a goiter operation, lesions of the recurrent nerve and severe hemorrhages are the most serious. The hemorrhage may be venous (as is most common), involving the large veins of the capsule or the pedicle, or arterial, affecting the branches of the capsule or the principal arteries. A hemorrhage may become alarming and require all the skill of an experienced surgeon to check it. Even a very small goiter may become very troublesome. Rolando reports that, in a case of retrosternal goiter, with compression of the trachea, extracapsular ligation of the inferior thyroid artery and later of the superior thyroid artery made the operation simple and expeditious. He reserves preventive ligation for cases of diffuse and retrosternal goiter; that is, goiters that, from the operative side, are regarded as the most difficult and dangerous. In such cases, he is convinced that preventive ligation of the inferior thyroid artery is a valuable expedient.

Hemangiomas of the Parotid.—From his personal researches and from data collected from the literature, Forni concludes: The parotid gland may be the seat of tumors that develop from vascular tissue (hemangiomas). The lesion (forty cases collected from the literature) is always unilateral, occurring with the same frequency on either side and in the two sexes. The hemangioma may be regarded as a congenital disease, occurring almost always in infancy and probably originating from a vascular malformation dating from the fetal period.

This hypothesis, which is advanced also for angiomas of other regions, is strengthened in the case of angioma of the parotid gland by the intense process of embryologic involution that characterizes this region. The hemangioma may occur in a simple or capillary form, or it may be cavernous (cavernoma). The simple angioma may, in process of evolution, be transformed into a cavernoma. Glandular tissue reacts in several ways to the angiomatous process. This rarely invades the whole gland; the superior surface, the deep surface and the anterior surface are the parts most affected. Sometimes phenomena of degeneration and of atrophy of the acini, with conservation of the excretory canals, are observed; at other times, signs of periacinose and pericanalicular infiltration, and fibrous transformation and sclerosis of the stroma are seen. The functioning of the gland (secretion of saliva) may persist, and, in some cases, it even appears to be augmented. The angioma of the parotid gland does not differ, in its macroscopic characteristics, from ordinary angiomas of other organs. It varies in volume, and may go beyond the parotidean space and invade the contiguous tissue. It is not improbable that an angioma of the subcutaneous tissue of the region may invade secondarily the tissue of the parotid gland. In that case, the differentiation between a primary and a secondary hemangioma may be difficult, if not impossible. The symptomatology is meager: swelling of the cheek, sometimes slow and sometimes rapid in evolution, soft, pseudofluctuant, reducible, which increases in size with weeping, on exertion, following mastication, and in all conditions that cause an afflux of blood to the part. It is not advisable in the author's opinion, to resort to exploratory puncture for the diagnosis. The characteristics mentioned are sufficient to establish the diagnosis as to the nature of the disease, but it is more difficult to locate the exact seat. Sometimes it is impossible, even through operation. The treatment followed in most cases is surgical: extirpation of the tumor with partial resection of the gland. The tumor may recur owing to incomplete removal. The operation may cause a salivary fistula to develop, and may injure one or more branches of the facial nerve. The author did not find any records of cures effected by radium, while the old methods (cautery, injections of alcohol) predispose to infection and secondary hemorrhage and have been abandoned in favor of surgery. He thinks, however, that radium therapy may possibly give as good results as are obtained in the treatment of angiomas of other regions.

Policlinico, Rome

35: 289-344 (June 15) 1928. Surgical Section

*Respiratory Mechanism in Pulmonary Tuberculosis Treated by Collapse Therapy. V. Bonomo.—p. 289.
*Serous Renal Cysts. A. Botto-Micca.—p. 303.
*Idem. G. Giordano.—p. 318.

Respiratory Mechanism in Pulmonary Tuberculosis Treated by Collapse Therapy.—Bonomo asserts that the most reliable criterion for determining the ordinary respiratory capacity and diagnosing respiratory insufficiency is the measurement of the tidal air. In pulmonary tuberculosis, examination of the respiratory function through study of the mechanism of respiration results usually in a marked decrease in the cases of supposed respiratory insufficiency. The disturbance of respiratory function is, in the majority of cases, associated not with the reduction of the respiratory area, which may be less than two thirds of normal without the appearance of signs of functional insufficiency, but with toxic stimulation of the respiratory center. The proof that dyspnea is not due to impaired respiratory function lies in its progressive diminution and disappearance as a result of the application of collapse therapy, notwithstanding the reduction of the respiratory area thereby entailed.

Serous Renal Cysts.—Botto-Micca emphasizes the rarity of serous renal cysts. Their origin is still obscure, though several theories have been suggested. Their diagnosis is always very uncertain, as there is no special pathognomonic sign or symptom. The prognosis is favorable. Treatment should be chiefly conservative; radical treatment (total nephrectomy) should be resorted to only in cases in which it is found that excision of the cysts presents difficulties and the danger of subsequent serious disturbances, owing to the fact that the part of the kidney preserved is small and atrophic.

Serous Renal Cyst.—In view of the benign character of the lesion, Giordano favors conservative rather than radical treatment of serous renal cyst. He cites a case in a woman, aged 36, in which a tumor of the right kidney, the size of a large orange, was resected from the cyst wall. The patient was dismissed in thirty days, completely cured, gaining weight and with no discomfort. The right kidney is fixed.

Rivista di Clinica Medica, Florence

29: 207-252 (March 15) 1928

*Eosinophils in Effusions. A. Vignolo-Palombella.—p. 207.
*Meningeal Hemorrhages. A. Montanari.—p. 220. C'en.

Percentage of Eosinophils in Various Effusions; Clinical Significance.—Vignolo-Palombella asserts that eosinophils are not always present in the various types of pleuritic and peritoneal effusions and that, when present, the percentage varies considerably. The presence of eosinophils in an effusion does not indicate its nature, but their number is in relation to the intensity of the stimulus and to the character of the organic defense.

Meningeal Hemorrhages.—From a study of his own cases and those reported in the literature, Montanari concludes that: 1. Meningeal hemorrhages affect chiefly women, especially at the menopause, and young persons. 2. The anatomicopathologic substratum does not appear to be an ordinary anatomic change in the meninges or the blood vessels; it appears to be very slight or only functional. 3. For the causation of the hemorrhage a special meningeal predisposition must be assumed, consisting probably in minute anatomic or functional changes of the smaller blood vessels of the pia mater, and a cause precipitating the hemorrhage itself. 4. In the author's own cases, the predisposition appeared to be based on an hereditary tuberculosis, with the site of predilection in the meninges and in the lungs; also in the literature hereditary tuberculosis was suggested most often—more rarely, congenital syphilis. 5. The precipitating cause is difficult to determine, and doubtless varies from case to case. Disorders of the endocrine and sympathetic systems predominate, associated with the menstrual and climacteric states, intestinal lesions resulting from bacterial action, and tuberculous toxins of a latent infection, reactivated from time to time.

Deutsches Archiv für klinische Medizin, Leipzig

160: 257-378 (July) 1928

*Polycythemia with Termination in Anemia. F. Delhougne, E. Gotschlich and Froboese.—p. 257.
Distribution of Hydrochloric Acid and Ferments in Gastric Contents. F. Delhougne.—p. 267.
Peculiar Nuclear Metamorphosis in Leukocytes. S. Donhoffer and M. Mittag.—p. 271.
Mechanism of Specific Dynamic Action of Protein. H. Reinwein.—p. 278.
Behavior of Caverns During Coughing: Auscultation Phenomenon. A. Winkler.—p. 300.
Behavior of Calcium in Presence of Epinephrine. H. Lawaczeck.—p. 309.
Ameboid Movements of Leukocytes in Quartz Cover-Glass Specimens. E. von Philipsborn.—p. 323.
Depish-Hasenöhrl's Function Test of Island Apparatus. E. Kylin.—p. 348.
Causes of Lowering of Intra-Ocular Pressure in Hypoglycemia. E. Wiechmann and F. Koch.—p. 361.
*Rumbling Noises in Wall of Thorax in Suppurations of Thoracic Cavity. W. Stepp and R. Cobet.—p. 368.

Polycythemia with Termination in Anemia.—In one of the two cases reported by Delhougne et al., the patient had had polycythemia for ten years. He was irradiated over the spleen and various parts of the skeleton with small doses of roentgen rays. At the beginning of the treatment, the erythrocytes numbered 8,900,000, the leukocytes 7,000 and the hemoglobin percentage was 135. About six weeks after completion of the treatment, the erythrocyte count was 5,400,000, the leukocyte count 5,000 and the hemoglobin 70 per cent. The patient was apparently well for a year. Paleness of the skin then began to be noticed. Infection resulted from the sting of an insect and from that time he felt weak and had palpitation of the heart. Examination showed 2,000,000 erythrocytes, 1,600 leukocytes and a hemoglobin percentage of 36. Following the transfusion of a small amount of blood, with rise in temperature, there was a sudden migration into the blood of great numbers of large cells (erythroblasts). The patient's condition grew steadily worse. Death took place after two and one-half months.

Toward the end the clinical picture was that of acute myeloid leukemia. The leukocytes rose to 56,000 shortly before death. In the blood removed from the vessels of various organs after death and in the blood coagula from the heart, the picture was that of leukemia with increase of immature, colorless blood cells. The bone marrow corresponded to that described for polycythemia except that there was hemosiderosis and absence of hyperemia and of increase in megakaryocytes. The spleen was greatly enlarged, but was not hyperemic; the enlargement was due, rather, to proliferation of myeloid tissue. Hemosiderosis, fatty degeneration of the parenchyma, hemorrhages and erythroblastic regeneration were found in the bone marrow, spleen, liver and kidneys. These phenomena belong in this case to the anemia rather than to any form of polycythemia. The authors believe that the anemia resulted from the irradiation rather than from infection. They report a second case of transition of polycythemia into anemia, in which, however roentgen irradiation was not given. The anemia followed an attack of pneumonia. Necropsy was refused.

Rumbling Noises in Wall of Thorax in Suppurations of Thoracic Cavity.—A further case of abscess of the thoracic wall giving rise to rumbling sounds on palpation is reported by Stepp and Cobet.

Deutsche medizinische Wochenschrift, Berlin

54: 1321-1362 (Aug. 10) 1928. Partial Index

Action of Chalybeate Spring Water on Metabolism. M. Kochmann and H. Seel.—p. 1321.
Extended Indications for Simultaneous Bilateral Artificial Pneumothorax. M. Ascoli.—p. 1322.
Treatment of Cardiac Insufficiency with Squill. G. Eismayer.—p. 1324.
Encephalography, Suboccipital Puncture and Myelography. Wartenberg. —p. 1325.
*Reducing Treatments in Patients with Heart Disease. A. Hirschbruch. —p. 1327.
*A New Scarlet Fever Serum. F. Meyer.—p. 1328.
Epidemiology of Scarlet Fever in Berlin. E. Seligmann.—p. 1329.
*Normal Serum or Scarlet Fever Therapeutic Serum in Elicitation of Blanching Phenomenon? H. Lampert.—p. 1332.
Treatment of Multiple Sclerosis with Antimony. W. Crecelius.—p. 1332.
*Delayed Fracture Healing. K. Werwath.—p. 1334.
Lamblia Intestinalis with Signs of Cholelithiasis. E. Schill.—p. 1337.
Importance of Sufficient Current in Roentgen Institute. E. von Schubert. —p. 1338.
"Ovarian Hormone Therapy." E. Kosminski.—p. 1339.

Reducing Treatments in Patients with Heart Disease.—Hirschbruch treated five patients with heart disease with a thyroid preparation for the purpose of reducing fat. One patient proved refractory. In the remainder there was a reduction in weight varying from 8 pounds (3.6 Kg.) in eighty-seven days to 13 pounds (6 Kg.) in sixty-nine days. The treatment was well borne. In two cases, with fatty deposits on the heart, the cardiac condition improved.

A New Scarlet Fever Serum.—Meyer's researches convince him that the scarlet fever streptococcus is a nonspecific streptococcus. The streptococcus forms, in succession, toxins for the blood, the organs and the skin. Whether a serum acts on the primary symptoms of the scarlet fever or on the complications depends on which antitoxin it contains. The fever and exanthem are acted on by what is now usually known as scarlet fever serum, which contains skin antitoxins; the complications are acted on by the author's streptococcus serum (Höchst), which contains organ antitoxins. A serum which contains both skin and organ antitoxins has now been prepared, the combined scarlet fever serum (Höchst). This serum has been tested clinically by Finkelstein in four series of patients with the following results: The average duration of the fever was 16.6 days in patients given symptomatic treatment only, 12.7 days in patients given Behring serum (skin antitoxins), 7.3 days in patients given streptococcus serum (Höchst) and 5.3 days in patients given the new combined scarlet fever serum. The percentages in which complications appeared were 91.1, 69.6, 59.6 and 29.6, respectively, for the four groups.

Normal Serum or Scarlet Fever Therapeutic Serum in Elicitation of Blanching Phenomenon?—In seventeen clinically certain cases of scarlet fever, normal serum failed to elicit the blanching phenomenon in eleven; scarlet fever therapeutic serum, in only four. The phenomenon was always more distinct when scarlet fever serum was used.

Delayed Fracture Healing.—An analysis of 1,800 fractures shows that poor callus-formation is most frequent in factures of both bones of the leg. There follow, in order of descending frequency: fractures of the femur, the humerus, the tibia, both bones of the forearm, the radius, the ulna. The analysis gives no support to the view that old age is in itself an unfavorable factor. The chief causes of delayed consolidation are, Werwath states, unfavorable position of the fragments, extensive defects in the periosteum and unsatisfactory relations between periosteum, endosteum and marrow. A constitutional tendency to poor callus-formation is sometimes encountered. Injection of the patient's blood under the periosteum at the fracture site has proved useful.

Jahrbuch für Kinderheilkunde, Berlin

120: 253-366 (July) 1928

Chronic Pyurias. P. György.—p. 253.
Renal Rickets and Renal Nanism. P. György.—p. 266.
Metabolism in Children with Cirrhosis of Liver. H. Knauer and K. Friedländer.—p. 292.
Movements of Small Intestine in Infants. A. Peiper and H. Isbert.—p. 306.
Movements of Large Intestine in Infants. A. Peiper.—p. 312.
*Congenital Tuberculosis in Twins. K. Choremis.—p. 319.
Content of Trypanocide Substance in Blood in Childhood. S. Levy.—p. 325.
*Auscultation in Enlarged Bronchial Glands. H. Kowarski.—p. 336.

Congenital Tuberculosis in Twins.—Choremis reports the occurrence of tuberculosis, apparently congenital and of intra-uterine origin, in twin girls (foundlings). When received, the infants appeared normal and sufficiently well developed for their age, 3 weeks. The tuberculin test, applied as a routine, was positive. The condition of the children deteriorated rapidly and they died after two weeks or less. The diagnosis in one case was generalized tuberculosis with particular localization in the lung; in the other case, miliary tuberculosis of the lungs. It is noted that in the second case the child never had fever and that at necropsy there were no signs of tuberculosis in the hepatic region; neither liver nor spleen was palpable. Tuberculids were absent in both cases; if they had been present, they disappeared before the children were brought to the institution.

Auscultation in Enlarged Bronchial Glands.—Kowarski places the child with the head and upper extremities hanging down. The stethoscope is placed between the crest of the scapula and the spine. He now percusses over the spinal processes lightly with the finger from the tenth thoracic vertebra upward. In normal children a clear sound is obtained as far as the third or first thoracic vertebra. In case of enlarged glands, the sound becomes duller where the glands are. If the stethoscope is placed first on the right side and then on the left, the side on which the glands are enlarged can be determined. This method, he points out, can be used with very young children and with fat children.

Klinische Wochenschrift, Berlin

7: 1537-1584 (Aug. 12) 1928

Importance of Vegetative System in Balneology. H. Vogt.—p. 1537.
Experiments in Production of Silent Syphilitic Infection by Active Immunization. H. Reiter.—p. 1539.
*Action of Insulin on Heart. E. von Haynal, L. Vidovszky and G. Györgi. —p. 1543.
Blood Circulation in Inflamed Lung. C. A. L. Binger, W. Ehrich and R. V. Christie.—p. 1549.
Rôle of Stomach in Regulation of Acid-Base Equilibrium. M. Bakaltschuk.—p. 1551.
Absorption of Carbon Dioxide Through Skin. S. Hediger.—p. 1553.
Significance of Blood in Gastric Contents in Examination with Small Tube. I. N. Scheftel.—p. 1557.
*Sedimentation Speed of Erythrocytes in Infectious Diseases, Particularly Scarlet Fever. W. Stoltenberg.—p. 1559.
Formation of Melanomas in Offspring of Xiphophorus Helleri Mated with Platypoecilus Maculatus Var. Rubra. G. Häussler.—p. 1561.
Heterogenic Antigens of Fish. A. W. Kalajew.—p. 1562.
Modern Methods of Treating Sterility. F. Engelmann.—p. 1563.
Enlarged Thyroids in School Children. S. Samelson.—p. 1567.

Action of Insulin on the Heart.—Von Haynal et al. made electrocardiographic studies on thirty-three nondiabetic patients with cardiac disease after intravenous administration of from 20 to 30 clinical units of insulin, fasting. The electrocardiogram presented changes in form, which did not correspond to a hypoglycemia and were not influenced by dextrose or atropine but were the expression of a direct action by insulin

on the heart muscle. There were changes in rhythm, which were the consequence of hypoglycemia. It appears that as little as 20 units of insulin can occasion injurious disturbances of rhythm and of conduction of stimuli. Such patients, when subjected to insulin treatment, should be given large amounts of carbohydrates, and in diabetic coma they should receive dextrose by the vein or rectum simultaneously with the large doses of insulin required.

Sedimentation Speed of Erythrocytes in Infectious Diseases, Particularly Scarlet Fever.—Stoltenberg studied the sedimentation speed in 172 cases of scarlet fever and found that it had neither prognostic nor diagnostic value. In infectious diseases accompanied by leukopenia, the reaction of the sedimentation to the inflammatory stimulus was slower and less pronounced than in infectious diseases accompanied by leukocytosis.

Medizinische Klinik, Berlin

24: 1259-1296 (Aug. 17) 1928. Partial Index

Roentgen Diagnosis of Gastric Ulcer. A. Slauck.—p. 1259.
*Basic Problems of Experimental Tumor Research. K. Löwenthal.—p. 1263.
*Suprarenal Transplantation and Organ Therapy in Addison's Disease. E. Leschke.—p. 1268.
Anaphylaxis and Jarisch-Herxheimer's Reaction. L. Böhmig.—p. 1269.
*Treatment of Tuberculosis with Intracutaneous Inoculation of B C G. H. Maendl and O. Lichtwitz.—p. 1270.
Results and By-Effects of Acridine Treatment of Gonorrhea. E. Langer and L. Dressler.—p. 1271.
Protein Therapy of Disturbances of Vegetative Nervous System. B. Greinzweig.—p. 1272.
Leukocytic Inclusions in Acute Yellow Atrophy of Liver. K. Blum.—p. 1277.
Treatment of Migraine with Intravenous Injections of Strontium Preparation. M. Serog.—p. 1279.

Basic Problems of Experimental Tumor Research.—Löwenthal inoculated mice subcutaneously with mouse embryo or placental substance, obtained under aseptic conditions. The mice were from 2⅓ to 5⅔ months old when inoculated. They were from 1 year and 2⅔ months to 2 years and 4½ months old when killed. They were of various litters of the same breed, but the different litters did not spring from the same parents. The experiments were performed to discover whether inoculation of normal, particularly embryonal, tissue would result in tumor formation. Eight true tumors developed in six of the nineteen animals of the experiment. The tumors were of various sorts (adinocarcinoma, lymphosarcoma, myoma, hypernephroma). Different tumors appeared in the same litter. The author feels forced to assume that they were spontaneous tumors. The fact that some of the animals remained free in spite of having reached the appropriate age speaks for a mendelian tendency to tumor formation. How far the inoculations acted as an irritation to excite or speed up the manifestations cannot be said.

Suprarenal Transplantation and Organ Therapy in Addison's Disease.—An abstract of a report of this case appeared in THE JOURNAL, August 25, p. 603.

Treatment of Tuberculosis with Intracutaneous Inoculation of B C G.—Sixty patients with pulmonary tuberculosis were inoculated by Maendl and Lichtwitz with living Calmette tubercle bacilli (B C G) intracutaneously, for therapeutic purposes. The initial dose was from 1 to 2 million organisms, according to the strength of the patient. From two to four inoculations were made with intervals of from two to four weeks. The local reaction in patients with weak allergy was a slight reddening of the skin. In allergic patients, specific ulcers developed. Stormy local or general reactions were absent. No harmful results of the inoculations were seen; on the other hand, a definite therapeutic effect was not demonstrable.

Monatsschrift f. Geburtshülfe u. Gynäkologie, Berlin

79: 253-392 (July) 1928

*Early Diagnosis of Pregnancy from Urine. A. Dienst.—p. 253.
Surface Tension of Serum During Pregnancy. H. Eufinger.—p. 271.
*Tubo-Uterine Pregnancy Carried to Term. Z. von Szathmáry.—p. 277.
Danger of Rupture of Uterus After Abdominal Delivery. H. Küstner.—p. 286.
*Local Treatment of Puerperal Sepsis with Besredka Autovaccine. G. Aschermann and L. Rosenblum.—p. 293.
Results of Operative Treatment of Carcinoma of Ovary. E. Schleyer.—p. 302.
Provisions of German Law Concerning Midwives. E. Martin.—p. 315.

Early Diagnosis of Pregnancy by Urine Test.—For more than a year Dienst has been testing the urine with ninhydrin for the early diagnosis of pregnancy, using the same method as in his blood serum test. Only in two cases of missed abortion did he find it necessary to use the blood test also. When a decided violet color is produced in the urine, there is no doubt of pregnancy. When toxicoses are present the color is paler. There is also some coloration before and after menstruation. Dienst recommends the urine test because of its harmlessness and simplicity.

Tubo-Uterine Pregnancy Carried to Term.—Szathmáry has found no case of interstitial pregnancy in the literature similar to the one which he describes. It cannot be classified either as a utero-interstitial pregnancy, in which the ovum develops toward the uterus, or a tubo-interstitial pregnancy, in which the development is toward the tube. The ovisac during its growth took in not only the interstitium and the uterine cavity, but also a portion of the isthmus of the tube. The patient, a primigravida, aged 24, showed no signs of abnormal pregnancy when examined externally on admission to the hospital. A sudden attack of coughing, dyspnea, and abdominal pain, however, together with distention of the abdomen and dulness in the lumbar region, pointed to peritoneal shock. Extra-uterine pregnancy was suspected, but on internal examination it was found that the fetus was in the uterine cavity. Laparotomy, under local anesthesia, revealed a foot hanging in the free abdominal cavity. A well developed dead fetus was extracted. The fundus of the uterus was found to be entirely ruptured from right to left between the two tubes. The uterus was amputated high above the bladder so that the entire cervix as well as the isthmus remained. Eighteen days after the operation the patient was discharged, the abdominal wound having healed by first intention. For nearly three years following, the patient was examined at intervals and was found to be well; she menstruated regularly.

Local Treatment of Puerperal Sepsis with Besredka Autovaccine.—Aschermann and Rosenblum report six cases of severe sepsis which they treated according to Besredka's principle; not, however, with culture filtrate but with autovaccine. This method was used because no filtrate was ready, and it took less time to prepare the autovaccine. Five of the patients recovered, only one died. The method of treatment is as follows: The uterine cavity is irrigated with physiologic salt solution. This is absolutely necessary before the first tampon is introduced, but may be omitted later. A tampon saturated with autovaccine bouillon is then applied. It should be introduced not only into the vagina and cervix but into the uterine cavity. It is important to continue the treatment a sufficient length of time.

Münchener medizinische Wochenschrift, Munich

75: 1365-1404 (Aug. 10) 1928. Partial Index

Type of Mind of Physician. F. Moritz.—p. 1365.
Limits of Action of Plasmochin in Treatment of Natural Human Malaria. O. Fischer.—p. 1369.
Oxydative Blood Destruction and Protection of Hemoglobin. K. Bingold.—p. 1373.
*Inhalation of Carbonic Acid Gas in Cases of Alkaloid Poisoning. K. H. Erb.—p. 1376.
Etiology and Clinical Picture of Sepsis. Schemensky and Noetel.—p. 1377.
Inspiration of Dry Air by Means of Aerophore. G. Liebermeister.—p. 1380.
*Epidemic of Infectious Erythema. P. Kissinger.—p. 1381.
Diet Tables for Diabetic Patients. W. Fornet.—p. 1381.
"Effusion in Knee Joint with Bone Thickening from Overexertion in Sports." P. Pitzen.—p. 1383.

Inhalation of Carbon Dioxide to Stimulate Respiratory Center in Cases of Alkaloid Poisoning.—A man, aged 23, with inoperable malignant tumor of the pharynx, took 15 drops of 1 per cent morphine one morning. In the evening he was given 0.01 Gm. of morphine subcutaneously and, since this failed to bring relief, a subcutaneous injection of 0.0005 Gm. of scopolamine. An hour later it was noticed that his breathing was very slow. After the lapse of another hour, he was taking only four breaths a minute, and those with difficulty. High-grade cyanosis appeared, the pulse became small and rapid, and breathing ceased. Artificial respiration was not successful in starting spontaneous breathing. Lobeline was without effect. Insufflation of carbon dioxide was now started through the

tracheotomy tube that the patient wore. Spontaneous breathing began after a few seconds. At the end of three minutes the insufflation was stopped. The patient, who was now taking sixteen inspirations in the minute, opened his eyes and spoke, and then fell asleep again. In the course of the night it was necessary to repeat the insufflations twice, as breathing gradually slowed and threatened to stop. By noon of the next day he had returned to his usual condition.

Epidemic of Infectious Erythema.—Nine of the ten cases reported by Kissinger occurred in a home for children threatened with tuberculosis. The house had fifty-one inmates, aged from 4 to 14 years. The first case appeared four and one-half weeks after the latest admissions. The first case was considered to be a light case of measles. There was, in addition to the exanthem, fever, coryza, conjunctivitis, slight redness of the throat and swelling of the glands of the neck. Fever appeared only twice again in the series of ten cases, and in most coryza, conjunctivitis, swollen glands, etc., were also absent. The eruption, which in some cases resembled measles, in others erysipelas, was confined in most cases to the cheeks and the extensor surface of the arm, where it appeared in garland form. There were no complications and in only one case did the illness last longer than a week. One case occurred outside the institution. It was in a 4 year old child who had not come into close contact with the children of the institution. All the patients except one were girls. All had drunk raw milk.

75: 1405-1444 (Aug. 17) 1928. Partial Index

Infraroentgen Rays in Treatment of Polycythemia Rubra. G. Bucky and E. Freund.—p. 1405.
Experiences in Diagnosis and Treatment of Scarlet Fever by Dick Methods. H. Mommsen.—p. 1408.
*Almond Milk and Fruit as Infants' Diet. W. Camerer.—p. 1410.
Diagnosis of Chronic Hemiencephalitis. R. Hanau.—p. 1413.
Limits of Action of Plasmochin in Treatment of Natural Human Malaria. O. Fischer.—p. 1417. C'cn.
Science and Illusions. E. Almquist.—p. 1420.

Almond Milk and Fruit as Infants' Diet.—Camerer investigated the effect of a diet consisting of almond milk and the diluted juice and pulp of various fruits, uncooked, on infants of various ages, both normal and with digestive disturbances. The results were not satisfactory. Normal increase in weight was not maintained, and one baby developed eczema, which cleared up on a diluted cow's milk diet.

Wiener Archiv für innere Medizin, Berlin

15: 401-560 (July 20) 1928

Epigastric Pulsation. N. Fukui.—p. 401. C'cn.
Two Cases of Chronic Infectious Anemia. R. Boller.—p. 429.
Arthropathia Psoriatica and Arthritis in Persons Suffering from Psoriasis. E. Zellner.—p. 435.
Cholecystography. V. Finsen and T. Geill.—p. 453.
Experimental Studies of Respiratory Sounds Over Caverns. A. Winkler. —p. 463.
*Congenital Heart Defects. H. Rösler.—pp. 487, 495, 507 and 521.
Roentgen-Ray Picture of Heart in Hyperthyroidism. H. Rösler.—p. 539.
Results of Tryptophan-Poor Diet in Exophthalmic Goiter. E. Schill.—p. 547.

Congenital Heart Defects.—Rösler reports the results of roentgenographic examinations in sixty-eight persons—some supposedly normal, others with cardiac symptoms. In 88.2 per cent the results were positive. Of these positive cases 20 per cent showed changes exclusively in the heart; 18.3 per cent, exclusively in the great blood vessels; 38.3 per cent, chiefly in the aorta; 60 per cent, chiefly in the pulmonary artery. In 58.3 per cent of the positive cases (or 51.4 per cent of all the cases), the roentgen observations were of value in establishing diagnosis. An investigation of the family history was made in sixty cases. In seventeen of the cases "heart diseases" were reported. In no case, however, could familial occurrence of congenital heart disease be definitely established. In three cases, disease or trauma was present in the first two and one-half months of pregnancy. Mental disease (aside from that due to syphilis and alcoholism) was found once. Definite alcoholism was present in the ancestry in eight cases (13.3 per cent). There was a history of consanguinity in six cases (10 per cent). As to a connection with syphilis, clinical evidence was found in one case when the Wassermann reaction was negative; in one case in which the Wassermann reaction and the clinical observations were negative, there was progressive paralysis in the ancestry; in two cases (in adults) there was a positive Wassermann reaction with negative clinical findings; all other cases were negative. The author feels justified in emphasizing the significance of alcoholism and consanguinity in the etiology of congenital heart defects, but does not consider that an etiologic relationship between such defects and syphilis has as yet been demonstrated. A detailed report is given of a case of congenital pulmonary stenosis in a child who died at the age of 7 years. Necropsy confirmed the diagnosis of stenosis of the pulmonary artery with defect of the intraventricular septum and "riding" (*reitende*) aorta. There was also found an old healed endocarditis. Whether this was of fetal or postfetal origin could not be ascertained, but the evidence was in favor of fetal origin. To this endocarditis was attributed the infravalvular stenosis of the pulmonary artery. Two cases of stenosis of the aortic isthmus are reported. The first patient, a man, aged 45, had no symptoms at all until he was 30 and the symptoms were not marked until he was 44 or 45 years old. Then he noticed the effect of slight exertion on his heart. He became easily excited and had attacks of headache, dizziness, and ringing in the ears. There was also a tendency to coldness of the extremities, particularly in the feet. After two years' observation, during which he was in relatively good condition, the patient died suddenly. Necropsy confirmed the diagnosis of stenosis of the isthmus and mouth of the aorta. The walls were greatly thickened and there were deposits of calcium in the aortic valve and the constricted isthmus. In addition, an old mitral insufficiency was discovered. This, as well as the aortic stenosis, was found to have been due to an endocarditis of long standing. There were also old lesions in the brain. Noteworthy was the difference in the condition of the blood vessels of the upper and lower halves of the body; the former showing thickening of the walls, rigidity, and changes in the intima; the latter having tender walls. The second patient, a man, aged 35, had not only been free from symptoms but had led a very active life. Nosebleed was frequent, at times occurring every fourteen days. This, the author points out, is always a warning (high blood pressure). There was a moderate hypertrophy of the left side of the heart, but the condition of the ventricles did not deviate so far from the normal that this was shown in the electrocardiagram.

Wiener klinische Wochenschrift, Vienna

41: 1177-1212 (Aug. 16) 1928. Partial Index

*Early Mortality of the New-Born. H. Heidler.—p. 1177.
Cisternal Puncture in Treatment of Epidemic Cerebrospinal Meningitis. V. Palcsó.—p. 1182.
Relations of Filtrable Virus to Certain Forms of Tuberculosis. S. Sterling-Okuniewski.—p. 1184.
*Case of Sepsis Agranulocytica with Cure. K. Bix.—p. 1185.
Noncarcinomatous Gastric Tumors. W. Schosserer.—p. 1188.
Treatment of Cheiropompholix and Eczema Mycoticum Palmare et Plantare. I. Prochnik.—p. 1189.
Combined Therapy of Neurosyphilis with Skin-Inoculation Materials. H. Schrottenbach.—p. 1190.
Syphilis and Pregnancy. H. Katz.—p. 1192.
*Malformed Human Embryo of Fourth Week. G. Politzer and H. Sternberg.—p. 1195.
*Treatment of Exophthalmic Goiter and Hyperthyroidism at High Altitudes. V. Hecht.—p. 1195. C'cn.
"Tuberculin Problem." J. Hämel.—p. 1199.
Reply. H. Koch.—p. 1199.

Early Mortality of the New-Born.—Birth trauma (intracranial lesions) stands first on the list of causes of early deaths in new-born infants in Heidler's statistics. Fatal traumatism is possible in the course of spontaneous birth as well as in operative delivery. The injury may be the result of precipitate birth, but a protracted labor is the more frequent cause. While Heidler deprecates forcible measures, he believes that obstretrics should, in the interest of the child, be somewhat more active. A corollary is that the hospital is the proper place for delivery.

Case of Sepsis Agranulocytica with Cure.—Bix regards the agranulocytosis in this case as a symptom of the staphylococcus sepsis which had its origin in a tonsillar infection. The injury to the granulocyte apparatus appears to have been caused by the toxins. The disappearance of granulocytes from the blood was, however, responsible for the fact of tissue injuries in the form of necrosis, rather than of inflammation.

Malformed Human Embryo of Fourth Week.—The embryo in question was 1.9 mm. long. The back was curved

so that the head and the tail almost touched. The individual organs showed widely varying degrees of development. The primitive vertebrae and the anlage of the uropoietic system were absent. The central nervous system was open in its entire length, while the development of other organs, such as the aural depression and the rectum, corresponded to a stage in which normally from twenty to twenty-two primitive vertebrae are present, i. e., the fourth week.

Treatment of Exophthalmic Goiter and Hyperthyroidism at High Altitudes.—To obtain therapeutic results from a sojourn in the mountains, the patient with exophthalmic goiter or hyperthyroidism should remain at least two or three months; the altitude should be between 1,000 and 1,200 meters. The climate at this altitude diminishes the frequency of the pulse. It is important that at least the first part of the time should be passed in a sanatorium. On arrival the patient should spend twenty-four hours in absolute physical rest, preferably in bed. Later, the greater part of the day should be spent lying down in the open air. The effect of the rarefied air in diminishing oxygen tension is of greater importance than the effect of the sun's rays. Sunshine tends to increase metabolism and is not well borne by patients with exophthalmic goiter. Air baths should be substituted for sun baths. The tranquilizing effect of mountain scenery on the psyche is a factor of no little importance.

Zeitschrift für Kreislaufforschung, Dresden

20: 457-488 (Aug. 1) 1928

*Breath Holding Test in Functional Diagnosis of Heart. B. Palcsó.—p. 457.
Action of Bivalent Manganese on Circulation. F. W. Caliebe.—p. 463.

Breath Holding Test in Functional Diagnosis of Heart.—Cardiac compensation, Palcsó states, is incomplete when the recumbent patient is unable to hold his breath longer than twenty-two seconds after walking 50 meters in thirty seconds. The length of time that the breath can be held is a useful criterion in diagnosis, prognosis and choice of treatment.

Zentralblatt für Chirurgie, Leipzig

55: 1921-1984 (Aug. 4) 1928

*Roentgenotherapy of Suppurating Abdominal Operation Wounds and Consequent Peritonitis. H. Edelmann.—p. 1923.
*Treatment of Acute Progressing Phlegmon of Extremities with Constrictive Hyperemia. G. J. Breitmann.—p. 1926.
*Spinal Anesthesia. H. Hilarowicz and M. Szajna.—p. 1930.
Roentgen Diagnosis of Presence of Nonopaque Foreign Bodies. M. Sanitzer.—p. 1936.
Spoon Handle in Bronchus. F. Krauss.—p. 1941.
Central Dislocation of Head of Femur. H. Weitz.—p. 1942.

Roentgenotherapy of Suppurating Abdominal Operation Wounds and Consequent Peritonitis.—Edelmann's experience with the roentgen treatment of suppurating abdominal wounds consecutive to an appendectomy has shown that wound healing is influenced favorably thereby—but the dosage must be small. Large doses not only retard healing but have an unfavorable effect on the healing process.

Treatment of Acute Progressing Phlegmon of the Extremities with Constrictive Hyperemia.—Breitmann has used constrictive hyperemia in the treatment of acute phlegmon for twenty years with uniformly good results. He emphasizes several points in the technic of applying the bandage. One should begin its application as far proximad from the disease as possible. The bandage should be applied loosely at first. After three or four hours it may be tightened, but not to such a degree as to obliterate the arterial pulse. It should never cause pain. The bandage is left on for about twenty hours. Then it is removed for from two to four hours; the extremity is elevated to relieve the edema. The bandage is reapplied. Gradually the time of application is reduced until by the third or fourth day it is left on for only twelve hours. By the seventh or eighth day all the symptoms will have disappeared and the patient feels well.

Spinal Anesthesia.—Hilarowicz and Szajna report on their experiments with spinal anesthesia. They advocate the addition of potassium chloride to the procaine hydrochloride, because it increases the depth of the anesthesia and yet is not a source of danger. They use 3 per cent procaine hydrochloride with 3 per cent potassium chloride in 2 cc. quantities, and 4 per cent procaine hydrochloride and 4 per cent potassium chloride in 1.5 to 2 cc. quantities. The latter combination gives a far-reaching anesthesia; for instance, injection between the third and fourth lumbar vertebrae produced a ventral anesthesia reaching as high up as the xiphoid cartilage. Satisfactory anesthesia was obtained with 2 per cent procaine hydrochloride and 1.1 per cent potassium chloride in 4 cc. quantities. Long and repeated boiling does not impair the effectiveness of the mixture.

Zentralblatt für Gynäkologie, Leipzig

52: 1945-2008 (Aug. 4) 1928

Methods of Producing Twilight Sleep in Obstetrics. H. Kienlin.—p. 1946.
*Puerperal Gangrene of the Extremities. O. Schmidt.—p. 1950.
Effect of Ergot Preparations in Streptococcic Infection. P. Caffier.—p. 1953.
*Prophylaxis of Mastitis. F. Anders.—p. 1965.
Cavernous Hemangioma of the Breast. H. O. Neumann.—p. 1967.
*Malignant Suprarenal Tumor Diagnosed from Vaginal Metastasis. H. U. Hirsch-Hoffmann.—p. 1970.
Modification in Technic of Cervical Cesarean Section. B. Aschner.—p. 1977.
*Treatment of Leukorrhea by Irrigation Under Pressure. W. Eichengrün.—p. 1978.
Pain in the Sacral Region and Back. P. H. Rulle.—p. 1980.

Gangrene of Extremities Following Normal Delivery, Tubal Pregnancy, and Septic Abortion.—Two of the cases reported by Schmidt were symmetrical gangrene. In one the gangrene developed in connection with septic abortion. After operation—removal of the terminal phalanges of the third toe and great toe on the left foot, and of all but the great toe on the right—the patient recovered and was able to walk with two canes or even without. In the other case, in which an ergot preparation had been injected during labor, superficial gangrene developed after a spontaneous delivery. After five weeks the gangrene had disappeared entirely. In the third case mummification developed in the right foot and lower leg as the result of an embolism in the femoral artery following tubal pregnancy. Three weeks after amputation of the right leg the patient died.

Prophylaxis of Mastitis.—The treatment described by Anders does not begin until after delivery. From the first day of the puerperium, after the breasts have been carefully cleansed with soap, boracic ointment is applied to the nipples. As a protection from contact with the clothing and the bed linen, a nipple shield of aluminum is used, held in place by bandages crossed over the breast. This shield is sterilized every day and applied with sterile forceps. An important factor in the success of this prophylactic treatment is the fact that the patient becomes trained in habits of cleanliness and also of self observation, so that the least pain or soreness is reported to the physician. The author reports that whereas sore nipples were formerly found in from 30 to 40 per cent of cases in the Breslau Women's Clinic, since the new treatment has been used the percentage has gone down to from 8 to 10.

Malignant Suprarenal Tumor Diagnosed from Metastasis in the Vagina.—In Hirsch-Hoffmann's patient, a woman, aged 71, there was a sudden onset of severe leukorrhea, which soon showed admixture of blood. A hard tumor about the size of a hazelnut, with ulcerated surface, was found on the anterior wall of the vagina. A specimen was examined histologically and found to be of the type of the suprarenal cortex, resembling in many places the zona glomerulosa and fasciculata. Accordingly it was diagnosed as a metastasis of the suprarenal tumor. The vaginal tumor, which had grown to about the size of a walnut, was extirpated as radically as possible. About four months later the patient died. Necropsy revealed a suprarenal tumor.

Treatment of Leukorrhea by Irrigation Under Pressure.—Eichengrün describes an apparatus by which fluids are introduced into the vagina under pressure. A pressure of about 40 mm. of mercury is maintained for five minutes, the pressure being indicated by a sphygmomanometer. The vagina is distended and is filled with the fluid, a portion of which also penetrates into the cervical canal. Then the pressure is lowered, the walls of the vagina collapse, and the fluid flows back into the apparatus. Of the various solutions used for irrigation, the best results were obtained with silver nitrate (from 3 to 5 per cent). The author reports that in 100 cases of cervical and vaginal leukorrhea treated by this method, two thirds of the patients were cured.

Nederlandsch Tijdschrift voor Geneeskunde, Haarlem

72: 3523-3650 (July 21) 1928

Constitution and Disease. N. P. Tendeloo.—p. 3524.
*Transplantation of Mouse Sarcoma into Normal Mice and Mice Injected with Trypan Blue. G. O. E. Lignac and J. G. A. Kreuzwendedich von dem Borne.—p. 3534.
Connection Between Menstrual Cycle and Ovulation. M. A. van Herwerden.—p. 3546.
*Prognosis of Tuberculosis from Physicochemical Examination of Blood Serum. F. L. Oudendal.—p. 3549.
Radium Treatment of Conjunctivis Vernalis. P. J. Waardenburg.—p. 3565.
*Congenital Dislocation of Lacrimal Gland. J. A. van Heuven.—p. 3566.

Transplantation of Mouse Sarcoma Into Normal Mice and Mice Injected with Trypan Blue.—Lignac and von dem Borne found that sarcoma transplanted from a white mouse into a mouse injected with trypan blue grew more rapidly than when transplanted into a normal mouse. Inoculation of the sarcoma from the trypan blue mouse (first generation) into eighteen normal mice was without result; when inoculated into the second generation of trypan blue mice, the sarcoma grew well, but the latency period was prolonged. In the third generation there was great difficulty in getting the sarcoma (second generation) to grow. In the end, the sarcoma cells become "trypan-fast." Their growth energy was at its minimum in the third generation and reached its maximum in the sixth generation, when they grew rapidly even in normal white mice. From this point the growth energy rapidly declined, to reach a minimum again in the ninth generation.

Prognosis of Tuberculosis from Physicochemical Examination of the Blood Serum.—Oudendal's researches failed to show that serum globulin is increased in active tuberculosis. He believes that the micromethod of Kjeldahl measures the active serum globulin more accurately than does the Naegeli-Rohrer method, and although with the latter method the changes in the globulin content run parallel with the clinical condition, this is not so when the Kjeldahl micromethod is used. The specific viscosity, on the other hand, gives an unusually accurate impression of the condition of the patient. It increases as the tuberculosis gains ground. Unlike the serum protein percentages, it is not affected by the daily oscillations in the patient's condition.

Congenital Dislocation of Lacrimal Gland.—Van Heuven reports a case of coloboma and pedunculated fibroma of the upper eyelid in a 6 months old child, associated with a white tumor, having an elevation of about 2 mm. overlying the upper and part of the lower temporal quadrant of the cornea and covered by the conjunctiva. After removal of the fibroma, this tumor also, which was provisionally diagnosed as a dermoid or lipodermoid, was excised. It was firmly attached to the cornea throughout. It was found to consist of normal lacrimal gland tissue. Later the author saw a similar case of dislocation of the lacrimal gland in a girl, aged 11. In this case, as in the first, the condition had been present since birth and had previously been diagnosed as lipodermoid. Here also he operated. The tumor was loosely attached to the cornea, more firmly to the sclera. A normal lacrimal gland was found embedded in fatty tissue.

72: 3651-3758 (July 28) 1928

Essential Hypertension. W. Nolen.—p. 3652.
Coagulation of Fibrin. E. Hekma.—p. 3670.
*Meningitis Statistics. J. C. Schippers and H. J. Peters.—p. 3685.
Erythrodermia and Keratodermia Variabilis. P. G. Rinsema.—p. 3695.

Meningitis: Tuberculous, Cerebrospinal, Pneumococcus.—The statistics of 248 cases of meningitis are analyzed by Schippers and Peters. There were 187 cases of tuberculous meningitis. Of these, forty-five cases were in the first year of life; 153 in the first three years. A rapid and steady decline followed, to one case in the tenth year and two cases in the eleventh year. In forty-nine cases the illness began acutely. In thirty-five cases the pressure of the cerebrospinal fluid was less than 20 cm.; in eleven it was between 50 and 90 cm. Measles preceded the meningitis in sixteen cases, trauma in nine, pyelitis in eight, acute otitis media in seven. Tuberculosis alsewhere in the body was found in forty-two cases. Cure was obtained in one case. Examined five years later, the child still had facial paralysis and a mild tuberculosis of the knee. The statistics contain thirty-seven cases of cerebrospinal meningitis. Fourteen cases occurred in the first six months of life, twenty-three in the first year. There were seven recoveries and sixteen deaths among the infants; eight recoveries and six deaths among the children between 1 and 11 years of age. The mortality was greater among boys than among girls. Lumbar puncture and injection of serum seemed to have a favorable influence. Subsequent examination showed that of the fifteen patients who survived, nine are entirely cured, two are partial invalids, one child lacks one eye, another is totally deaf and three are very backward in development. There were twenty-four cases of pneumococcus meningitis. Nine were in the first six months of life, twenty in the first three years. Among the children less than 1 year old, three recovered and ten died; among the older children (from 1 to 8 years old), three recovered and eight died. In fourteen cases the disease began "spontaneously"; in nine it was preceded by pneumonia. Treatment consisted of lumbar puncture, combined in a few cases with injection of antipneumococcus serum. Only three of the children who survived the attack are now alive. These are now 19, 14 and 8 years old, respectively. The meningitis occurred during their first year. They are entirely healthy. Of the three other survivors, two died with disturbances of the central nervous system.

Bibliotek for Læger, Copenhagen

120: 529-588 (Aug.) 1928

*Clinical Investigations on Albumin and Globulin in Blood and Urine in Patients with Renal Diseases. T. Geill.—p. 529.

Clinical Investigations on Albumin and Globulin in Blood and Urine in Patients with Renal Diseases.—Geill made fourteen quantitative determinations of the serum or plasma proteins in eleven patients with renal disorders. The total protein was decreased in all cases, the result, almost wholly, of the reduction in the serum albumin, the albumin values being often very low, in one case 0.8 per cent. In twenty-three patients with albuminuria, 155 quantitative determinations of the albumin and globulin in the urine were made. He says that in acute renal diseases the albumin fraction is relatively low (from 65 to 85 per cent) but rises when improvement sets in or the process becomes chronic. The values are somewhat higher in chronic nephrosis (from 90 to 95 per cent) than in chronic nephritis, in the later stages of which relatively low values are often seen (from 75 to 80 per cent). In amyloid nephrosis the albumin fraction in most cases falls in the course of the last month or two from about 80 per cent to 50 per cent, or even lower; a low albumin value in a patient with chronic renal disease thus points to the presence of amyloid changes in the kidneys. In a chronic stage of nephrosis or nephritis with relatively stationary renal function, the quantitative relation between the albumin and the globulin in the urine remains constant and is independent of the protein content of the urine. The pathogenesis of albuminuria is discussed.

Ugeskrift for Læger, Copenhagen

90: 791-818 (Aug. 16) 1928

Treatment of Insulin Intoxication. H. Hulgaard.—p. 791.
Twenty-One Cases of Cardiospasm. A. Nielsen.—p. 796. C'cn.
*Diastase Reaction in Urine in Acute Infectious Diseases. S. Gørtz.—p. 805.

Diastase Reaction in Urine in Acute Infectious Diseases.—Systematic investigations during the febrile period in forty patients with paratyphoid showed more or less temporary increase in the diastase values of the urine in sixteen.

90: 819-838 (Aug. 23) 1928

Twenty Years' Experience with Appendicitis Treated Conservatively. N. Nissen.—p. 819.
*Conjunctival Diphtheria. H. Ehlers.—p. 823.
Treatment of Adiposity. C. A. Blume.—p. 828.

Conjunctival Diphtheria.—Ehlers describes six cases with diagnosis based on the presence of diphtheria bacilli in the affected conjunctiva. In the five cases observed from the start, a simultaneous diphtheria in the nose or nose and throat was demonstrated. Two cases were without false membrane. The most constant and in some respects the most characteristic symptom was the swelling of the eyelid. He suggests 40,000 antitoxin units intramuscularly in conjunctival diphtheria affecting the tarsus and the fornices in adults and children over 10 years, and also 16,000 units intravenously when the infection extends to the eyeball, with correspondingly smaller doses for younger children and with due regard to simultaneous diphtheria elsewhere in the patient. Local treatment also is advocated.